CRANFIELD UNIVERSITY

Jaume Serramalera Guerin

A METHODOLOGY FOR SUPPLY CHAIN REALIGNEMENT TO SUPPORT BUSINESS GROWTH IN FOOTWEAR INDUSTRY TRHOUGH RETAIL MARKET

Cranfield University
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MSc
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(NB. This section can be removed if the award of the degree is based solely on examination of the thesis)

ABSTRACT

The current study examined what factors have to be considered to realign the business model of a footwear SME towards a growth plan through retail market. The study looked to examine literature regarding all steps within the supply chain from procurement to distribution activities, including warehouse management. It brings together methods and best practices used to streamline supply and retail operations performance.

On the other hand, a business case has been exhaustively analysed, to identify the weaknesses an barriers that may prevent a business expansion from being successfully carried out. It includes a detailed description of the business activities, its organization structure and its financial situation.

A demand forecasting method has been specially tailored to the case study based on qualitative and quantitative techniques identified in the previous research.

The data obtained in the research, the business analysis and the demand estimation are then put through the development of new logistic strategies, with the aim to meet new B2B demand and ensure financial growth.

Retailers can use these results as a guideline or methodology to develop factors contributing to supply chain realignment and to support business growth through retail market.

Keywords:

Retail Market, Supply Chain, Business Growth, Demand Forecasting.

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LIST OF ABBREVIATIONS

IT	Information Technology
CAGR	Compound Annual Growth Rate
QR	Quick response
CRM	Customer Relationship Management
FMS	Forecasting Management System
FSS	Forecasting Support System
POS	Point of Sales
JIT	Just in Time
TMS	Transportation Management Systems
FMCG	Fast Moving Consumer Goods

1 PROJECT DEFINITION

1.1 Background

This project is focused on the challenges that a small niche company in the footwear industry, named SAYE, must overcome in order to accomplish its business growth. SAYE was, founded in 2018 and has headquarters in Barcelona. It is currently outsourcing many of its business activities, as it does not have enough capacity for in-house operations and its logistic planning is also constrained. More specifically, business development aspirations currently consider the challenges of how to grow in-house production capacity and the extent of their current (90% of sales volume) eCommerce basis in order to expand through retail sales.

1.2 Aim

Define a “business realignment model to enable transition from direct e-commerce sales to international retails sales for a footwear manufacturing SME”.

Although the priority is to reach the stated aim, other parameters such as the easiness of the realignment plan implementation and its impact in company visibility will be also taken into consideration to measure the project success.

1.3 Objectives

The following objectives need to be achieved in order to meet the stated aim:

- Analyse the baseline of a business expansion problem through a research of most common challenges that can been encountered in similar scenarios and the best practices used to face them.
- Identify and describe techniques to estimate sales volume growth due to expansion through retail market. This is a key step since it will reduce uncertainty and the subsequent logistic plan will be based on the result obtained from it.
- Design an approach to streamline distribution capacity to satisfy retailers’ demands, while reducing costs and increasing customer satisfaction.
- Build a methodology for retail business realignment, based on the research outcomes and tailor it to a specific case study in footwear SME manufacturing.
- Discuss the project findings, outline the overall outcomes and conclude about the viability and relevance of the project based on a cost vs benefit analysis.

1.4 Project Approach

Before defining the methodology that will be used to meet the listed objectives, it is necessary to describe the scope, exclusions, constraints and assumptions that define the framework of the project.

The literature review is the part that needs to be framed with more detail, since unnumbered business cases can be found regarding expansion strategies. This project will tackle this business problem from the operational point of view, it means only activities and common tools used in the process from procurement to distribution will be included, regardless if they are thereafter used for the specific business case discussed here.

On the other side, it will exclude other areas regarding brand visibility such as marketing activities. Besides, the research of similar scenarios will be reduced to only small or medium sized enterprises and the best practices they used to overcome growth problem.

Regarding the demand growth estimation, in case of uncertainty, the most extreme situation will be considered, it means the maximum possible value.

Since the company wants to keep its current manufacturing process to ensure the quality of its product and maintain its distinguished features, no changes will be made in this process. Therefore, the definition of new strategies to cope with the new demand will only consider changes regarding procurement, warehouse management and distribution channels.

1.5 Methodology and Expected Outcomes

The business realignment will be based in the current business model, the literature analysis and a cost vs benefit analysis of the proposal. The expected outcomes are:

- **Literature analysis and identification of methods and materials** of relevance to the study.
- **Case Study Analysis:** analyze current business plan including all activities from procurement to distribution (warehouse management, distribution network capacity, number of orders, procurement frequency, batch volume, etc.)
- **Demand forecast:** study and implement methods and tools for demand forecast and estimate the demand growth to be satisfied through the business expansion.

- **Design new logistic plan:** proposal of new strategies to satisfy the increasing demand when entering the retail market.
- **Cost vs Benefits evaluation:** to critically analyze return on investment and produce recommendations for similar business cases based on financial statement of the project.
- **Final Thesis presentation and poster.**

2 LITERATURE REVIEW

To ensure a comprehensive review, a few keywords have been selected to carry out the literature research and to then browse the identified papers. Therefore, before getting into our particular case study, different topics closely related with the project aim have been identified. They will help to better understand the current situation and trends of online and in-shop retailing and to identify some of the best strategies for business expansion through retail market. These key areas are shown in figure 1:

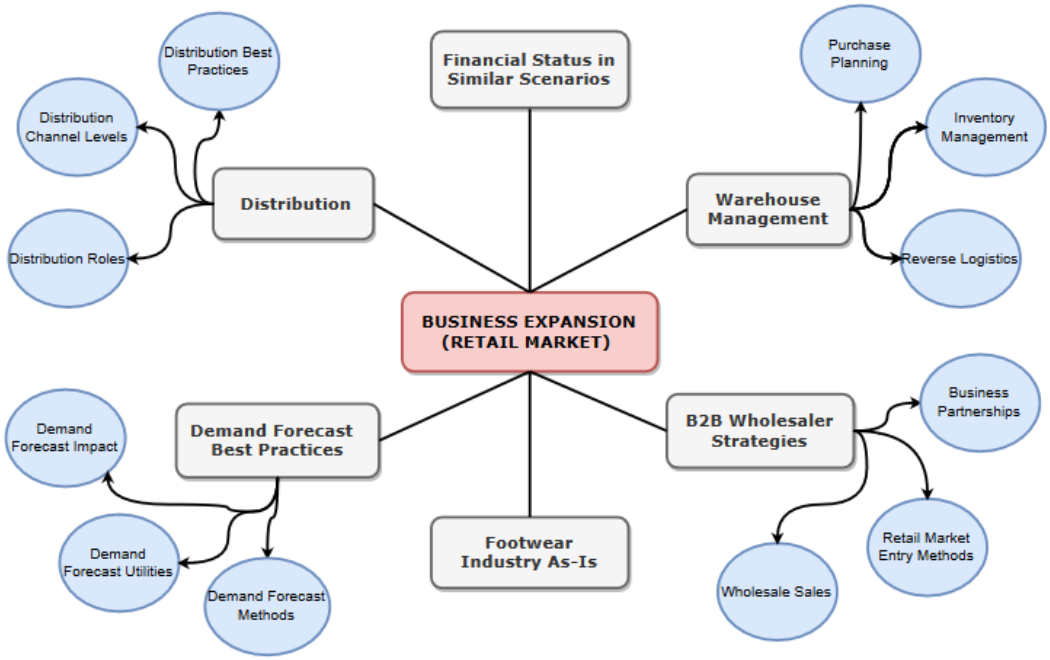

Figure 1. Literature Review areas

The main themes included in those papers are explained in the next chapter, but only some of the identified ideas have been developed.

3 RESEARCH MATERIALS AND METHODS

Each one of the topics mentioned above have been thoroughly explored and best practices or similar business cases exposed. This way, the results of the research can be set in the context of related work previously published by others.

3.1 Footwear Industry Trends and AS-IS

The paper “The Business of Shoes” [I], highlights the economic, social and product trends of this market. It also describes the types of retailer, key players and retail channels in modern footwear industry.

Globally, the largest market in terms of pairs purchased per capita is the United States. In 2019, footwear retail in the United States reached $60.53 billion, representing a value CAGR of 3.1%

Regarding the consumers share by age and gender, it is estimated that women’s products accounted for 48% of sales, while men’s and children accounted for 35% and 17%, respectively. The women’s category has shown the greatest revenue growth in the last five years, at $3.2 billion. However, the fastest-growing category is children’s footwear.

In the European region, UK is the biggest market, where footwear industry has grown from £9.6 billion in 2014 to $10.3 billion in 2015 and is expected to grow to £13.4 billion in 2020. In 2014, women’s shoes represented 55% of the market, with men’s and children’s shoes at 35% and 10%, respectively.

This report also defines the different types of retailers, (i.e. independents, multiples, non-specialist retailers, etc.) according to its product specialization, its sales size and its sales channel. The figure below shows, the sales share of each retailer type.

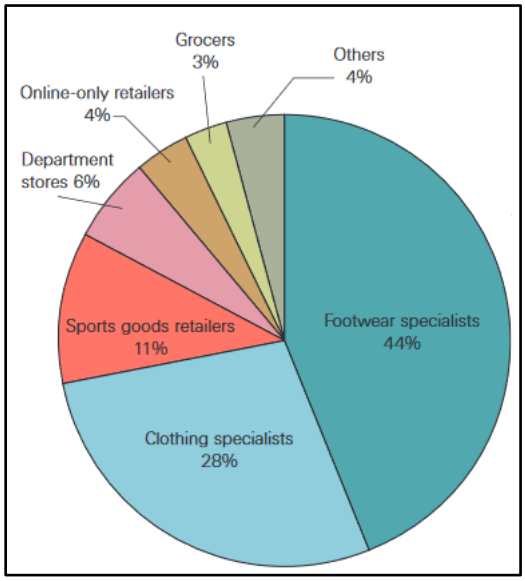

Figure 2. Distribution of UK footwear sales by retailer type, 2015. (Mintel Group Ltd., 2016)

The general trends in the footwear industry, regarding product type, are sports, casual, and lifestyle brands, which own the highest market shares and can be found across all retail channels.

Regarding retail channels, this paper explains that many successful retailers and brands use a combination of approaches to maximize sales opportunities and attract new consumers. What was known as a multichannel approach, i.e., selling product via a variety of retail channels, such as brick-and-mortar stores as well as online, has evolved into omni-channelling. Which is focused on creating a seamless consumer experience across all available shopping channels, (e.g. mobile internet devices, computers, brick-and-mortar, television, direct mail and catalogues)

3.2 Retail market segments

As it is explained in "*The Centre for Retail Research Blog*" [II], retail industry is experiencing rapid developments in both online and retail sales structures, due to the competitive environment that companies are facing.

Although, online retail is experiencing a general growth in all of Europe this is evolving at different speed in each country. Figure 3 shows the share on total online sales for various European countries along years 2014 to 2017 and the forecasted values for year 2018 to 2020. While absolute values are shown in table 1.

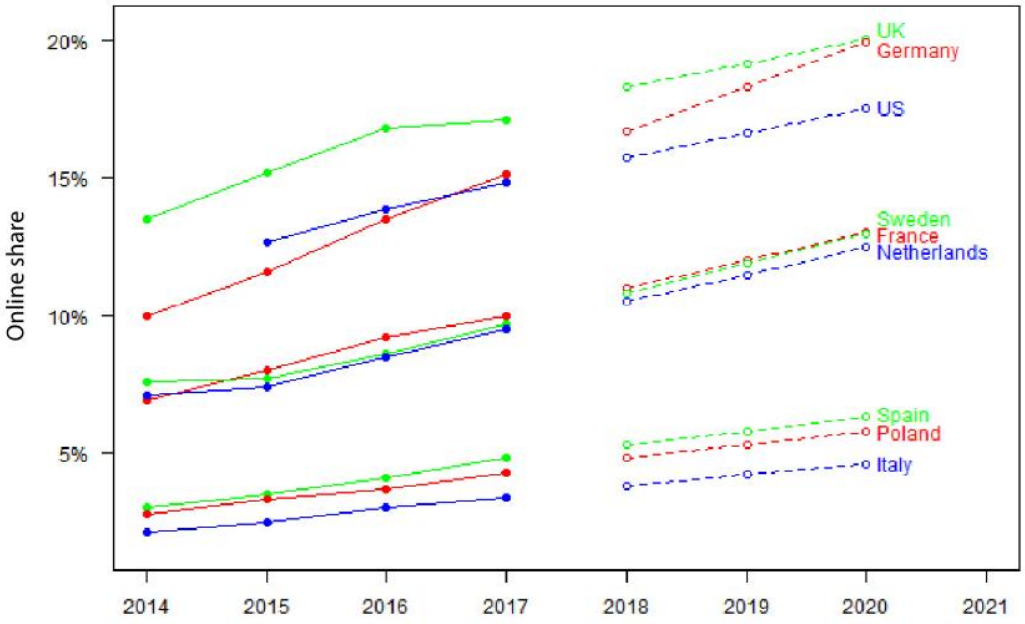

Figure 3. Online shares of retail trade. Source for the 2014–2017 data: Center for Retail Research (CRR). The results for 2018–2020 have been forecasted.

	2019	2020	2021	Sales Share 2019	Sales Share 2020 (F)	Sales Share 2021 (F)
UK	£76.036	£99.308	£92.266	19.4%	26.2%	24.3%
France	£46.688	£59.340	£58.088	10.9%	14.3%	13.8%
Germany	£68.484	£83.693	£80.680	15.9%	19.9%	18.7%
Spain	£14.111	£24.684	£23.623	5.4%	9.9%	9.3%
Italy	£10.140	£15.464	£15.031	3.7%	6.0%	5.8%
Netherlands	£8.964	£11.653	£11.443	9.9%	13.1%	12.5%
Totals	**£224.425**	**£294.142**	**£281.131**	**12.0%**	**16.2%**	**15.3%**

Table 1. Total Online Retail Sales 2019 – 2021 (estimate). Source: Center for Retail Research (CRR). Currency values are sterling (£) billions. F = forecast results.

The fact that buying online rather from traditional stores is comparatively easy and predictable, combined with an improvement of the legal protection for buyers has made online retailing attractive for a wide range of products. As a result, the number of eShoppers has drastically increased in the last years, as it is shown in the table below.

Country	2019	2020 (e)
UK	75.8%	76.9%
France	68.5%	72.4%
Germany	70.2%	76.4%
Spain	42.1%	51.2%
Italy	37.7%	49.6%
Netherlands	72.2%	76.1%
Averages	61.1%	67.1%

Table 2. Number of eShoppers as percentage of total population.

Source: Center for Retail Research (CRR). e = estimated.

On the other hand, in-shop sales still offer great advantages that cannot be obtained through eShopping. The customer experience is an important factor in all consumer goods sales but especially crucial for footwear products. This is perfectly explained by Mary Stuart [III], owner of "Mo Brog" an independent footwear store. Who defends that since shoes need to be tried on, in-shop sales are the best way to ensure a good customer experience and avoid returns. Therefore, she is skeptical about offering a transactional website.

3.3 B2B Wholesaler Strategies

This chapter describes a list of strategies to enhance wholesaler activities for business expansion.

3.3.1 Quick Response

The importance of offering a quick response service through manufacturer-retailer channels is exposed in a wide set of papers [IV], [V]. It includes information from industry sources that determine the pros and cons of offering a QR service. On one hand, reducing lead time allows retailers to adjust orders based on demand and therefore their interest to trade with wholesalers increases.

On the other hand, it has an impact on the manufacturer and wholesaler decision-making flexibility, since they have to meet tighter production and distribution commitments. Moreover, it suggests actions such as service level, wholesale price and volume commitments that can make QR profitable for both members of the channel, i.e. pareto improvement (economic concept named after Vilfredo Pareto, [VI])

3.3.2 Wholesaler-Retailer Terms & Conditions

Gérard P. Cachon and Martin A. Lariviere [VII], study the key terms and conditions under each wholesaler-retailer contract type.

Revenue-sharing contract type is commonly found in the literature. Under a revenue-sharing contract, a retailer pays a supplier a wholesale price for each unit purchased, plus a percentage of the revenue the retailer generates. The retailer chooses optimal price and quantity. It can also be extracted that, despite its numerous strengths, revenue sharing is not prevalent in all industries since, in some cases, it just provides a small improvement over the cheaper wholesale price contract.

On the other hand, the mentioned paper compares the case of a supplier selling to fixed-price vs a price-setting vendor. Further information regarding these concepts is provided by Steven Symes [VIII]. It includes a benchmarking between supply chain contracts such as buy-back, price-discount, quantity-flexibility, sales-rebate, franchise or quantity discounts.

3.3.3 Strategies to Boost B2B Wholesale Sales

Ling Wong recommends, in his publication [IX], some key approaches to attract customer sales:

- Make ordering, billing and shipping a seamless process.
- Offer fast shipping and on-time delivery.

It is extensively defended in the literature that information systems and business integration are two main aspects to meet these conditions.

Systems allow to manage and speed up B2B transactions such as customer experience or payment processes. Some examples are SAP, Pepperi, SalesForce, or Shippo. Nevertheless, it is important to select the one that best matches the particular business needs, to that end, key functionalities to take into consideration are:

- The server in which the platform is available (mobile, cloud, web based)
- CRM (Customer Relationship Management)
- Email Marketing
- Inventory Management
- Forecasting Management System (FMS)
- Returns Management
- Reviews Management

These capabilities streamline the delivery process through the automation of fulfillment activities, which results in fewer errors, delays or back orders. A retailer can lose revenue if a product is out of stock, but by offering fast shipping to customers without additional cost, they are more likely to order again. Some systems can carry out product demand forecasting, so production can be adjusted to demand

Regarding the second point, as it is widely discussed in the book “Demand and Supply Integration” [X], business integration is crucial to ensure an effective communication, coordination and collaboration among company entities and avoid production disruptions or stock inconsistencies.

For example, in many companies, the activities of the sales organization (retail partner centered) are not well aligned with the activities of the marketing function (final consumer centered). On the supply side, procurement is interested on chasing lowest-unit-cost raw materials, which may be found in low-labor-cost areas of the globe, while logistics may be striving to reduce transportation cost and maximize agility.

Business integration can be achieved through the utilization of the mentioned information systems or through a proper organizational structure.

3.3.4 Market Entry Methods

As it is described by Dana, L.P.[XI], there are different business models that a retailer entering a new market may adopt in order to build a presence in a new geographical territory. It is not always practical or profitable for the same business model to be used in the international market as the domestic market.

Therefore, retailers must investigate the most appropriate route for their international expansion via some of the following methods.

- Joint venture
- Concession
- Franchise
- Flagship/own retail
- Wholesale-distributor
- Wholesale-agent
- Wholesale-subsidiary
- Licensing

3.4 Demand Forecast Strategies & Best Practices

3.4.1 Demand Forecast Impact

Retailers' future planning depends in part on demand forecasts. As it can be read at "Estimating Demand Uncertainty" [XII], accurate demand estimations may result in a large increase of profitability, especially in low-margin, high-volume retailing. Therefore, a considerable amount of effort has been devoted to the development and improvement of forecasting models over the past several decades, and retailing has seen a shift from intuition to data-based decision making that can capitalize on this.

Forecasts are essential to support many decisions from the strategic to the operational area, such as marketing, sales, production, purchasing and finance. Forecasts also provide the basis for national, regional and local distribution and replenishment plans.

3.4.2 Demand Forecast Utilities

The book "Production and Operations Management" [XIII], describes how retailers can use data about their customers and their business operations to explore and exploit better. In many ecommerce and brick-and-mortar contexts, retailers can track not only what is being sold at different locations and times through point-of-sale (POS) systems but also who is buying these items.

This paper also explain how data can be used to tackle problems in retailing to improve assortment and pricing, or to quantify the impact of stockouts on lost sales and the impact of delivery time on revenue. Some of these utilities are:

- Optimizing store assortments: in response to changing demand patterns.
- Online dynamic pricing: software to track competitor's prices and other valuable data.
- Online order fulfillment speed: to shorten customer order fulfillment time.
- Estimating the impact of B2B service level on demand: Craig et al. (2016) uses experimental data to find out the increase in retailer demand associated to efficient customer service.

3.4.3 Demand Forecast Methods

There is an exhaustive research about this area of study, evaluating every existent forecasting technique. Robert Fildes, Shaohui Ma and Stephan Kolassa [XIV] study the problems that retailers face to develop accurate demand forecasting and its impact in retail business succeed. Furthermore, popular forecasting methods and practices are also examined in papers [XV] - [XVIII].

Nowadays, this process is generally delivered through methods embedded in a forecasting support system (FSS), as explained at [XIX] These systems are based in mathematical models which are simultaneously based in historical data.

3.4.3.1 Data Collection

As it is explained in the paper [XXII], proper collection of reliable data is crucial since basic product-level demand forecasting methods use only the past sales history. One of the key factors is to have a data pool big enough able to represent the demand behavior during a wide time window.

Regarding the existent methodologies to collect data, beyond the traditional and rudimentary techniques such as manual inputting of sales data, nowadays, Location Intelligence technology is used to identify variations in market conditions that are location specific.

Seasonality is a noise factor which also must be taken into consideration since it may affect data interpretation. Retail sales usually present strong seasonal variations, so seasonal modeling techniques may have and important role on the forecasting accuracy. Although seasonally adjusted data may produce more uncertainties, removing seasonal variations is one of the most traditional approaches to handle seasonality.

3.4.3.2 Quantitative Forecasting Techniques

a) Univariate forecasting methods

The most remarkable findings of the research in [XXIII], [XXIV] show that traditional time series techniques perform well for periods without focal product. Some examples are:

- Simple moving averages

- Exponential smoothing (ARIMA)
- Fourier analysis

However, univariate forecasting methods should be adopted only for products with a low promotional intensity or price elasticity of demand.

b) Linear causal methods

For periods with promotions, using methods with promotional drivers, such as linear causal methods, improved the accuracy substantially. For instance, linear regression is a simple and feasible causal method for large-scale forecasting problems. Examples of this kind of models are:

- SCAN*PRO [XXV]
- PromoCast [XXVI]
- Dynamic regression model [XXVII]

Further definitions of these models can be found in the indicated references and in [Appendix B Further Definitions]

c) Non-linear and machine learning methods

Nonlinear methods include traditional nonlinear regressions, non-parametric regressions and machine learning algorithms. They use different mathematical parameters, that represent sales variations in response to promotional instruments.

- Multiplicative (log–log)
- Exponential (semi-log)
- Log-reciprocal functional forms

Linear vs Non-linear methods

As explained at [XIV], linear models with various driver variables are generally better established than more complex methods and easy to implement. However, more complex nonlinear models should be considered if linear models fail to perform well.

Chu & Zhang [XXII], also examine in their study, several linear and nonlinear models that have been commonly used in modelling and forecasting seasonal time series. Specifically, it describes three classes of general modelling approaches.

- Box–Jenkins ARIMA → Seasonal univariate modeling
- Regression approach to seasonal modeling → Linear causal modeling
- Feedforward neural networks → Nonlinear modeling

The paper describes their mathematical models and how each one of them performs vs the real demand, figure 4.

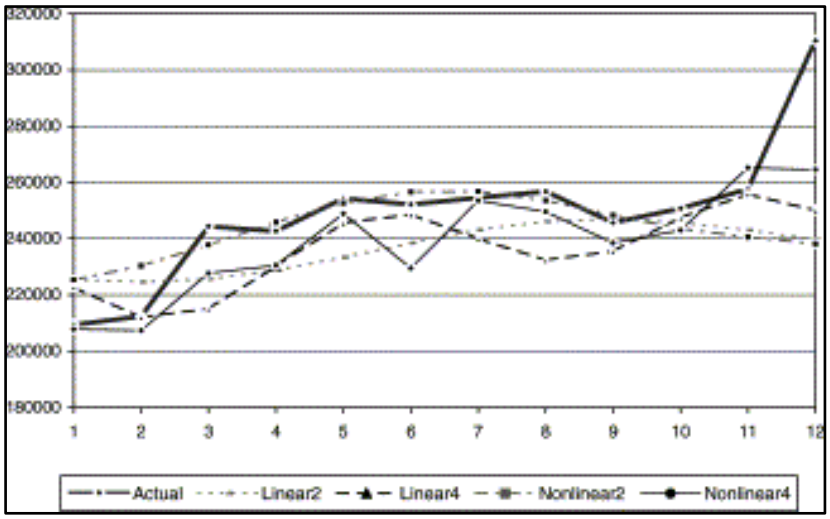

Figure 4. Performance of linear vs non-linear techniques.

This work also describes the types of errors commonly used to evaluate the performance of forecasting models:

- Root mean squared error (RMSE)
- Mean absolute error (MAE)
- Mean absolute percentage error (MAPE)

Finally, all studies agree that no single forecasting model is the best for all situations under all circumstances (Makridakis et al., 1982), [XXVIII].

3.4.3.3 Qualitative Forecasting Techniques

Sometime quantitative forecasting techniques are not accurate enough or they just can not be used due to the lack of historical demand data. In this case, qualitative techniques can substitute or complement them. The methods most referred in the literature are:

a) Jury of executive opinion: [XXIX], method of combining and averaging views of several executives regarding a specific decision or forecast.
b) Delphi Method: [XXX], tool for structuring a group communication process to identify issues for managerial decision-making.
c) Sales Force Composite: [XXXI], the sales agents forecast the sales in their respective territories and it is then consolidated to develop an overall company sales forecast.

Further definitions of these methods can be found in the indicated references and in [Appendix B Further Definitions]

3.5 Warehouse Management

Warehouse management is a key aspect of the supply chain management since it has a direct impact in the customers experience and it can produce high over costs if not handled properly.

3.5.1 Purchase Planning

The first step to ensure a correct warehouse management is the purchase planning since it directly affects the amount of stock maintained in the warehouse. Daniel Fritsch, [XXXII] defines the basics of purchase planning.

The order point is a critical parameter to maximize profits. It is essential to order enough stock with each order to reduce carriage costs and take advantage of bulk discounts, but at the same time, it is important to avoid overstock due to over-ordering. Depending on how purchasing is handled, there are two kinds of approaches:

a) Reactive approach: or “just in time” (JIT) approach. In this scenario the business only purchases stock when needed. It reduces working capital but can cause delays that result in stock outages and reduced customer confidence.
b) Proactive approach: this procurement strategy ensures enough stock to always meet demand, but it must be managed effectively to avoid overstocking.

Some key considerations for purchase planning are:

- Customer needs
- Business needs
- Warehouse and storage capabilities
- Budget
- Number of orders and batch size

The report mentioned above, also highlights some best purchasing practices and the advantages of using an ERP system with purchasing capabilities:

- Link customer orders with purchasing and enhance decision-making.
- Give real-time oversight of warehouse operations which enables stock to be moved to where it is needed, preventing overstocking and obsolescence.
- Use historical data produced by the software to predict seasonal variations in demand.

3.5.2 Reverse Logistics

Nowadays, the competitive advantage of retail enterprises depends on customer experience, which has a big impact in loyalty rates and in maintaining low operating costs. In addition, companies are more and more concerned about their reputation regarding sustainability. Therefore, retailers must have an efficient reverse logistics system, which plays a critical role in all the mentioned issues.

In his dissertation Dayong Xu, [XXXIII] probes into the existing strategic models to achieve these goals through reverse logistics. It provides insights in the following matters:

- Types of reverse logistics in retail industry.
- Main source of reverse logistic.
- Retail reverse logistics problems.
- Driving factors of reverse logistics in retail industry.
- Retail reverse logistics strategies and management solutions.

3.5.3 Inventory Management

Inventory management is a challenging problem for companies since inventories are a frozen fund that can be lost and have holding costs. However, it can help to streamline the quantity of inventories that will fulfil the demand, avoiding overstocks and stock-outs,

It is also useful to smooth production requirements or take advantage of order cycles and quantity discounts.

3.5.3.1 Inventory Management Dimensions

Evan L. Porteus [XXXIV], explains some of the most important aspects that must be considered when defining the inventory management strategies. They are briefly explained in table 3.

DIMENSION	DEFINITION / KEY CONSIDERATIONS
Product	Raw material, work in progress or finished good. Consumable or reparable. Continuous or discrete replenishment. Deterioration and lifetime.
Decision Variables	Amounts to order, stock levels, pricing, scheduling delivery dates, inspection, expanding capacity, setup reduction, quality improvement.
Decision making structure	One or many decision makers (i.e. owner, inventory manager)
Time	Continuous or discrete.
Demand	Deterministic or stochastic. Stationary or nonstationary. Influence factors (i.e. shortages, customer service time, prices)
Objective function	It always includes ordering costs, holding costs, and shortages. Costs can be stationary or not and deterministic or stochastic. It may also include other parameters such as discounts, revenues or service provided.
Ordering Costs	They may be proportional to the order quantity or they may incorporate a setup cost plus a linear, concave or convex term. Setup cost includes the cost of setup time.
Holding Costs	Includes both physical and financial holding costs, which account for the opportunity cost of capital. Deterioration, defects, obsolescence or the promotional value of positive inventories may also be accounted within holding costs determination.
Shortages	Shortages may be fully or partially backlogged and they may influence future demand.
Supply	The order lead-time may be deterministic or stochastic. It may vary predictably over time. It may depend on things like order quantity or policies. The amount received may differ from the amount ordered.
Physical System	There may be one or many facilities. They can be operating in series, in parallel and in an arborescence. For example, assembly of partially finished goods may occur at a facility, requiring availability of each of the inputs.
Information Structure	Stock levels can be reviewed continuously or periodically, This and other information, such as demand distributions and costs may be known with different accuracy levels.

Table 3. Most important aspects for defining the inventory management strategies

3.5.3.2 Inventory Management Best Practices & Models

Darya Plinere and Arkady Borisov [XXXV], go into different methods to deal with the management of stock levels and effectively meet demand. They use a real case study to prove the efficiency of four inventory management best practices.

- ABC classification: this is a supply chain technique that allows assigning priorities to different types of stock items in order to make time management and financial resources more efficient. It is based on the Pareto analysis. [Appendix B Further Definitions]
- Replenishment policies: this includes the determination of single or multi period inventory system, the reorder point, lead time, demand behaviour, etc.
- Demand forecasting algorithms: (chapter 3.4.3)
- Data analysis: this include techniques to detect stock management issues, such as inventories with no movements, inventories wasted due to expiration of time, or demand deviation from the forecasted demand. Figure 5 shows an example of the detectable deviation between the optimum stock level and the real stock quantity.

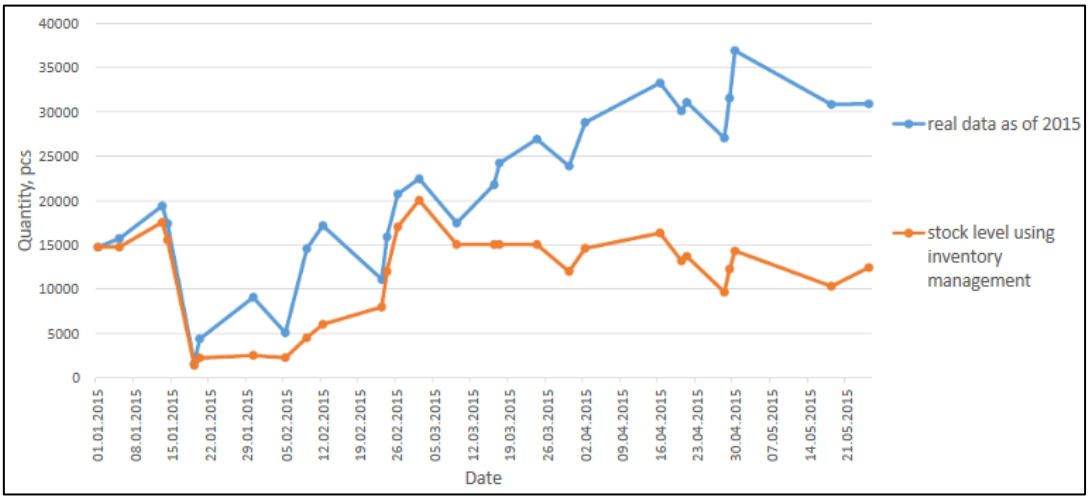

Figure 5. Comparison of the inventory management system with real data

Finally, this study brings together various inventory management models, which common goal is to define a proportional ordering cost function. Each of them has a unique mathematical form that defines an ordering cost function suitable for a particular business scenario. The models discussed are:

- Deterministic (EOQ) model

- Single period model
- Dynamic linear model
- Dynamic convex model
- Dynamic concave model

3.6 Distribution Strategies

This chapter first describes the levels of distribution channels and types of distribution role within a supply chain. Second, some methods and best practices to streamline the distribution process.

3.6.1 Distribution Channel Level

Generally, the literature [XXXVI] defines four different levels of distribution channels according to the number of intermediaries between the manufacturer and the final consumer of the product.

Level	Roles within the supply chain	Definition
0	Manufacturer → Customer	Direct channel, when the manufacturer sells the goods directly to the consumer
1	Manufacturer → Retailer → Customer	This method uses an intermediary. A manufacturer sells the goods directly to the retailer instead of selling it to agents or wholesalers. It is useful for selling FMCG
2	Manufacturer → Wholesaler → Retailer → Customer	Wholesalers buy the bulk from the manufacturers, breaks it down into small packages and sells them to retailers who eventually sell it to the end customers. Suitable for goods that are durable and standardised
3	Manufacturer → Agent → Wholesaler → Retailer → Customer	Under this one more level is added in the form of agent that facilitates to reduce the distance between the manufacturer and the wholesaler

3.6.2 Distributor Roles

Most of the literature regarding this distributor roles coincide that there are four different profiles according to its activities and relationships with the different supply chain players.

a) Distributor: a distributor is a wholesaler who, in addition to fulfilling retailer orders, they actively sell products on behalf of the producers.
b) Wholesaler: a wholesaler fulfills orders of retailers, by reselling goods, often in large quantities for manufacturers.
c) Retailer: retailers are the outlets where consumers can purchase products.
d) Broker and Agent: they handle the logistics of the sales, contracts, marketing, and customer relationship management.

Further definitions of these roles can be found in [Appendix B Further Definitions]

3.6.3 Distribution Methods & Best Practices

Distribution strategies depend on the type of product being sold. According to an article shared by Smriti Chand [XXXVII], there are three methods of distribution that outline how manufacturers choose how they want their goods to be dispersed in the market.

a) Intensive: this type of distribution aims to provide saturation coverage of the market by using all available outlets.
b) Selective: selective distribution involves a producer using a limited number of outlets in a geographical area to sell products.
c) Exclusive: only one wholesaler, retailer or distributor is used in a specific geographical area.

The article published by Lindsey Jenkins [XXXVIII] widely describes the key factors to take into consideration when selecting the proper distribution strategy:

- Item Type
- Customer Base
- Warehouse Capabilities

She also defines some of the most useful technologies for distribution management:

- Automation
- Internet of Things
- Cloud-Based Systems

Finally, the most common features that should be considered to select an appropriate distribution software are also described in this study, together with a list of the top customer relationship (CRM) and transportation management systems (TMS).

- Sales order management: it allows to input orders and transmit them to manufacturing so that items can be produced to meet customer needs.
- CRM: it can assist users in looking at customer information in real time to see historical purchasing information, such as products that are currently being waited on or most used payment methods.
- Inventory Management: (chapter 3.5.3)
- Logistics Management: this software enables transportation management and route planning. It also helps to select which items should be shipped together.

Another topic commonly found in the literature, is how to select a distribution partner and the terms and conditions of the working relationship. Some of these factors are:

- Shipping cost based in freight weight vs freight volume
- Carrier capacity in terms of time and geographic area coverage
- Cost conditions, i.e. fix cost and variable component depending on distance and quantity.

3.7 Business Financial Status in Similar Scenarios

Every business needs to have a continuous financial grow. However, according to their scale they have different behaviours. Emergent businesses have much bigger growth rates than those of established companies.

As it has been found in similar case studies [XXXIX], generally the growth of successful startups goes through three stages of the so called S-curve:

- Childhood: stage in which the startup has a very slow growth.
- Expansion: period of fast growth in which the company is already well organized.
- Maturity: if the startup becomes a large company, growth begins to be slower.

According to the literature reviewed, the ideal growth rate for a startup is between 5% and 7% per week. Trevor Blackwell has created a simple method to calculate whether a startup's growth will cover costs and after how long will that happen.

The venture capital firm Institutional Venture Partners conducted an analysis of 70 start-ups that grew and opened to the stock exchange. The idea was to determine the growth

rates they had in the 4 years prior to the opening on the stock exchange. The outcomes of the study were:

- Companies that had sales between less than $1 million and $25 million grew at a rate of 133% per year.
- Those with sales between $150 and $500 million grew at annual rate of 38%
- 69 of the 70 companies analysed grew more than 20% per year.
- 54 of the 70 companies grew more than 30% per year.

4 BUSINESS CASE STUDY

In order to have a better understanding of the current company situation and with the purpose of identifying the possible weaknesses that can be tackled and hopefully mitigated, an analysis of the business case has been carried out.

It contains a description of its main business activities, and an analysis of the business financial situation and the organization structure. The main information sources are:

- Business plan and company reports (confidential documentation)
- Interview to company Co-founders [Appendix A Interview Transcript]

4.1 Business Activities

This chapter provides a thorough overview of SAYE business activities.

4.1.1 Sales Channels

SAYE sells shoes through two different channels:

a) B2C (Business to Consumer)

This channel includes all sales where customers are directly reached with no intermediate agents through ecommerce. Although the startup was initially built up with the income obtained from sales through crowdfunding platforms such as Kikstarter, since November 2019 SAYE has its own ecommerce platform.

b) B2B (Business to Business)

This channel includes all sales to retailers. Nowadays SAYE sales to an average of 11 retailers per month, but many others have shown real interest to commercialize their products. The aim is to create a reliable structure to meet this new upcoming demand.

4.1.2 Manufacturing Process

Since SAYE is for the moment a small startup with no capacity to own the manufacturing activity, this service is outsourced to a Portuguese company named “YouShoes”. However, they directly participate in supply process by managing the procurement activities.

The price per unit is € 29 in average, which does not include the transport cost.

Regarding purchase orders, nowadays SAYE uses a simple method to decide when to order and the quantity ordered. The following data is input in an excel sheet (table 4)

- Number of sales orders received through the e-commerce platform
- Available stock
- Expected in-bound units
- Estimated sales per month for each product type

Product Type	Total Stock	Arriving current Week	Arriving current Month	Total Available (pre-order)	Estimated Sales per month	Month to out of stock	To be ordered	Total Available (post-order)	Ordered
M89-03-BEIGE-38	23	15	63	101	43	2,35	114	215	114
M89-03-BEIGE-39	36	9	12	57	34	1,68	113	170	113
M89-03-BEIGE-40	0	3	48	51	24	2,13	69	120	69
M89-03-BEIGE-41	6	15	27	48	23	2,09	67	115	67
M89-03-BEIGE-42	0	13	24	37	12	3,08	23	60	23
M89-03-BEIGE-43	1	18	19	38	15	2,53	37	75	37
M89-03-BEIGE-44	9	18	0	27	13	2,08	38	65	38
M89-03-BEIGE-45	0	11	21	32	12	2,67	28	60	28
M89-03-BEIGE-46	0	3	10	13	4	3,25	7	20	7
M89-03-BLACK-36	0	0	0	0	1	0,00	5	5	10
M89-03-BLACK-37	16	0	0	16	5	3,20	9	25	9
M89-03-BLACK-38	0	0	16	16	8	2,00	24	40	24
M89-03-BLACK-39	12	0	0	12	6	2,00	18	30	18
M89-03-BLACK-40	5	0	9	14	4	3,50	6	20	6
M89-03-BLACK-41	8	0	8	16	8	2,00	24	40	24
M89-03-BLACK-42	0	0	7	7	8	0,88	33	40	33

Table 4. Data to decide purchase orders.

The strategy is to make orders every two months with the aim to maintain a security stock level equivalent to 2.5 times the monthly sales. As a result, they are currently ordering 2,000 to 2,500 units, which equals what the company historically sells every two months. The lead time since the purchase order is released until the batch is receipt is 2 to 3 months.

4.1.3 Warehouse Management

The warehouse management is outsourced to a company named NAEKO, where SAYE maintains a stock level of about 2000 units.

All products manufactured in Portugal are transported to this warehouse, from where customer orders are fulfilled.

About 40 to 60 units are shipped to final customers every day. Instead, the number of orders received for B2B has a great variation, some months up to 600 units.

The cost for warehouse management depends on the parameters shown in table 5.

Cost	(€)
Pallet Unloading	3.0
Returns	1.5
Stock entries (per unit)	0.09
Insurance (per unit)	0.06
Maintenance (per unit & day)	0.01
Order preparation	1.6
Order preparation (additional pick)	0.2
Delivery Box Assembly	0.34
Output Labelling	0.12

Table 5. Breakdown of warehouse costs

4.1.4 Distribution Activities

According to the different distribution channel levels defined in the literature (chapter 3.6.1), SAYE structure can be classified within level two.

Among all the possible distributor roles, described at chapter 3.6.2, SAYE has taken the role of a wholesale-distributor. Nevertheless, they have the particularity of owning other business areas such as product design, marketing and customer service.

Currently, the company has two different distribution partners. On one hand “CS transitarios” is in charge of all product transport from the factory in Portugal to the Warehouse in Barcelona. This service is used once every two months approximately. On the other hand, they have a partnership with “UPS” for all distributions from NAEKO warehouse to final customers and retailers. They pick up all due deliveries every day around 4:00pm, regardless the number of orders received.

The cost charged by both partners varies according to the number of deliveries. While the transport cost is included in the final price for final customer sales, it is charged separately for retailers, unless they manage the procurement themselves.

4.1.5 Packaging Activities

Regarding the packaging activities SAYE relies in two different companies:

- Enveseur: they manufacture three types of packages for 1, 2 or 4 pairs of shoes.
- Sheedo: they provide tomato seeds, which are included with each pair of shoes. The costs vary according to the quantity ordered, which is normally of 5,000 units.

4.2 Financial Situation

4.2.1 Sales Volume

First, the sales volume of each distribution channel has been here studied. It includes the number of customers reached, the total units sold, and the total revenues obtained through B2C and B2B transactions.

a) B2C Sales

Nowadays, up to the 90% of the SAYE whole sales take place through e-commerce, where the product is directly distributed from warehouses to the final customer.

The business performance in this area is summarized within the figures below:

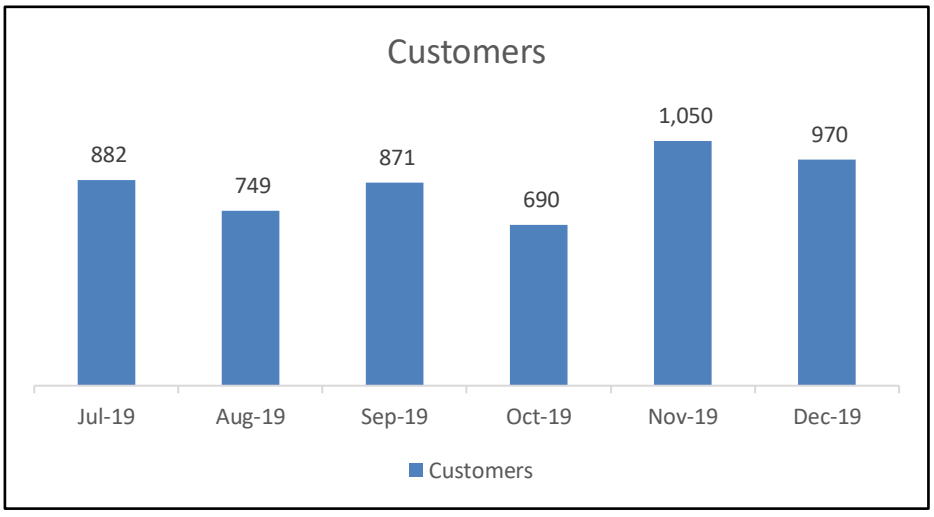

Figure 6. Evolution of B2C customers

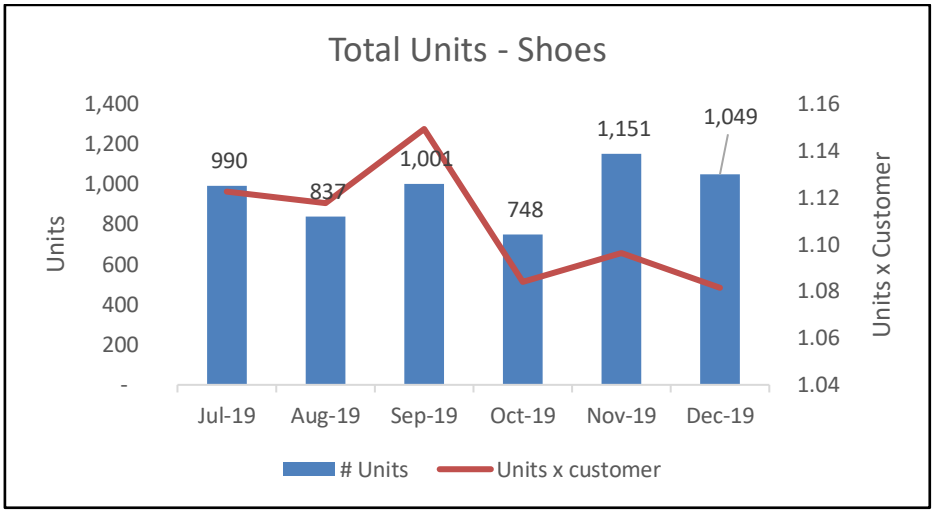

Figure 7. Evolution of B2C Total Sales

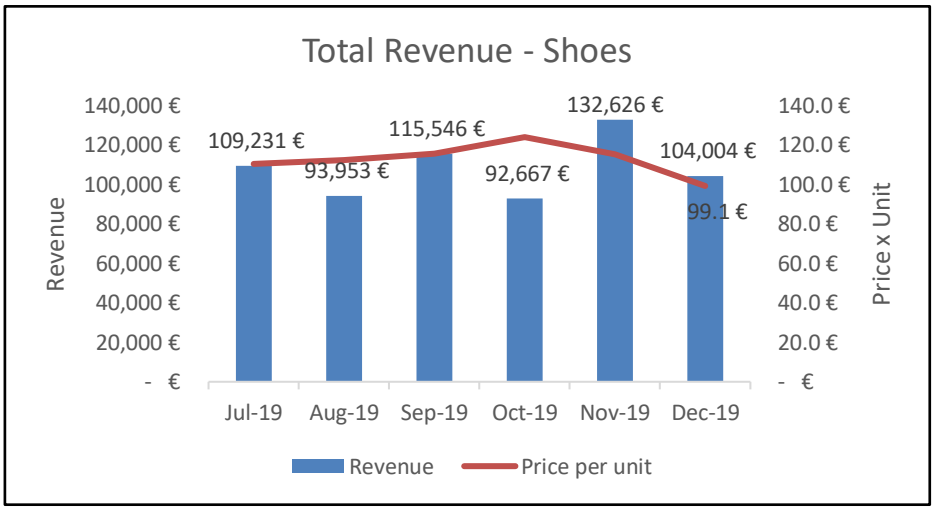

Figure 8. Evolution of Total B2C Revenue

The average revenue is € 108,005 per month.

b) B2B Sales

Since SAYE B2B activities are in a starting stage, the following graphs are only based on data collected during the second half of last year. They represent SAYE sales within the retail market.

Figure 9 shows the revenues per customer and the number of transactions with active companies, which are those with a continuous business relationship.

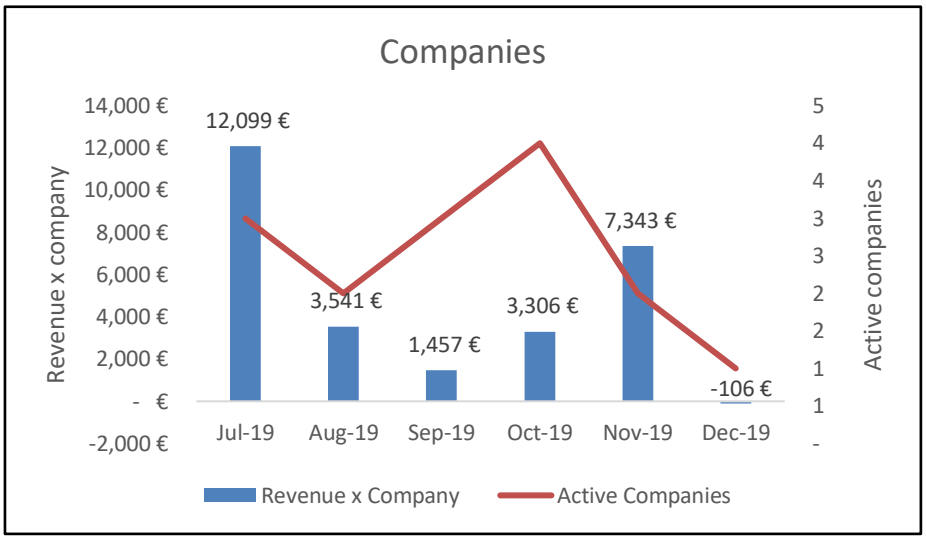

Figure 9. Evolution of revenues per company and number of active companies

Similarly, figure 10 shows the total units and units per company sold each month.

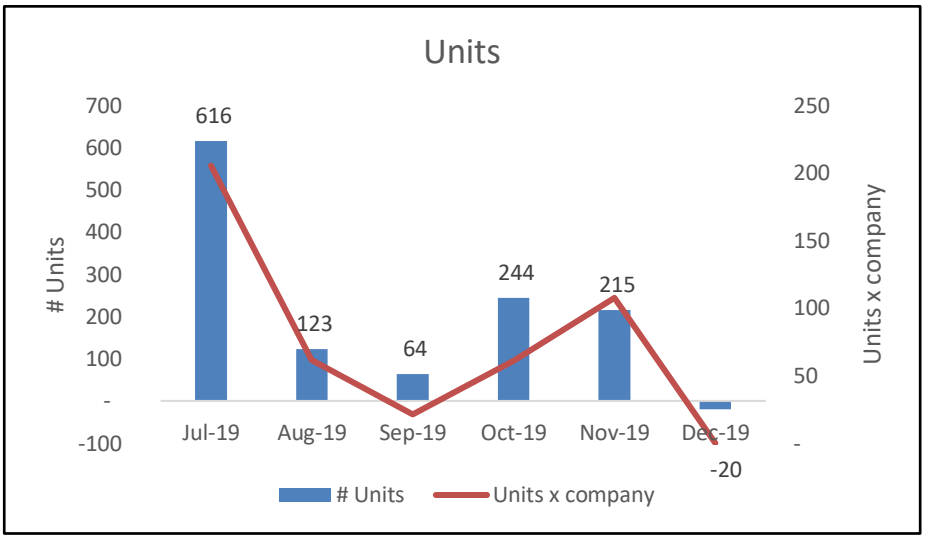

Figure 10. Evolution of total units and average number of units sold per month and customer

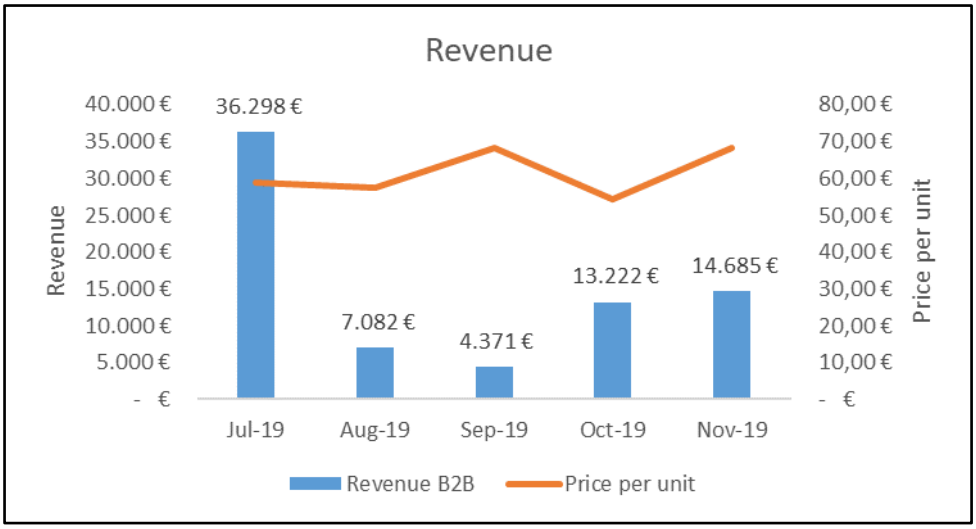

Figure 11. Evolution of total revenues and average price obtained per unit through B2B.

The average revenue is € 15,131 per month.

4.2.2 Profitability

The profitability obtained from each sale is also an important indicator. It has been analyzed for each sales channel.

Although all products have common costs regarding the manufacturing and logistics, the ones sold through B2C have additional costs related with sales campaigns, marketing and financial commissions. However, these costs are not included in B2B since the amount of sales made through retail market is still not significant. Therefore, investments in marketing and other support activities are only focused in B2C.

The revenue per unit obtained through each sales channel is also different. Their values are presented next, together with a detailed breakdown of the cost drivers used to calculate profitability.

a) Profitability B2C

B2C *(x unit)*	YTD 2018	YTD 2019
Revenue	74.89 €	105.23 €
Cost of Goods Sold (COGS)	33.90 €	32.19 €
Marketing	14.58 €	23.92 €
Crowdfunding	7.25 €	9.38 €
Financial Commission	2.84 €	3.23 €
Logistics	9.14 €	11.78 €
Sustainable Donations	1.05 €	0.89 €
Profitability	**6.13 €**	**23.84 €**

Table 6. Parameters to calculate profitability per unit and final value for years 2018 - 2019

The average profitability of one pair of shoes directly sold to end customers was € 23.84 during year 2019. The percentage represented by this profitability and the contribution of each concept to the total cost, can be observed in figure 12.

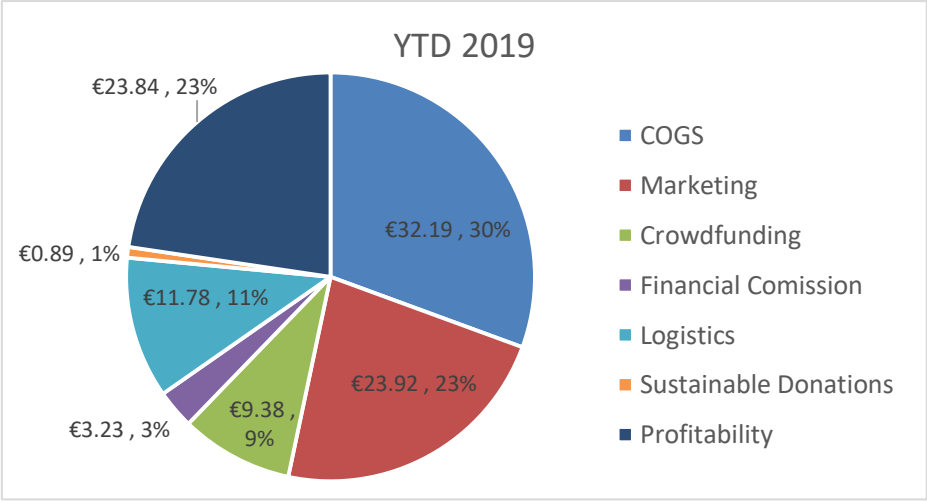

Figure 12. Profitability and contribution of each concept to the total cost

b) Profitability B2B

Due to the lack of historical data regarding B2B activities, the investment and costs linked to this sales channel is far less significant than the ones focused in B2C activities.

B2B *(x unit)*	YTD 2019
Revenue	59.00 €
Cost of Goods Sold (COGS)	25.26 €
Logistics	11.14 €
Profitability	**22.60 €**

Table 7. Profitability B2B year 2019

As it can be observed in figure 13, the average profitability of one pair of shoes directly sold to end customers was € 22.60 during year 2019.

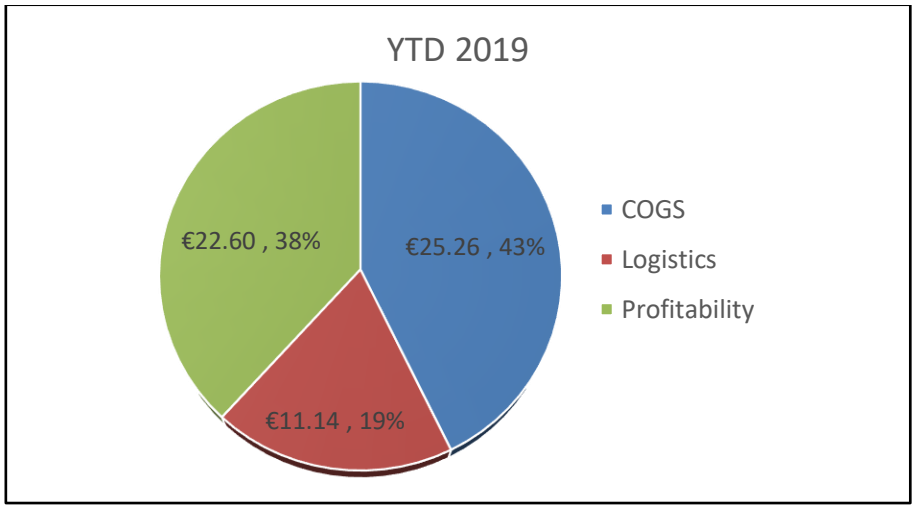

Figure 13. Average B2B profitability per unit in year 2019

The fact that profitability is very similar to the one obtained through ecommerce, together with the brand visibility opportunities that retail channel offers, are incentives, which make the entry to retail market interesting.

4.2.3 Operating Costs

The basic monthly costs of the company have been summarized in table 8. Variable costs depend on the number of commercialized units.

Operating Costs	(€)
Variable Costs	63,345
Sales & Marketing	24,424
Department Costs	23,340
R&D	1,544
Administration	4,912
Total Operating Costs	**117,566**

Table 8. Basic monthly costs of SAYE

As it can be observed in the tables below, every cost area has been broken down in more detailed cost concepts.

Variable Costs	(€)
COGS	38,881
Packaging	800
Marketing	885
Client Service	4,732
Financial Comission	3,816
Transport	10,039
Warehouse	2,668
Sustainable Donations	1,523
Total Variable Costs	**63,345**

Table 10. Variable costs

Sales & Marketing	(€)
Mkt Investment (e-Commerce)	12,574
In-house Ads for e-Commerce	2,919
Mkt Investment Crowdfunding	6,454
Others Mkt	2,476
Total Sales & Marketing Costs	**24,424**

Table 13. Sales & Marketing costs

Department Costs	(€)
Client Service	2,758
Product	1,734
Mgmt&Admin	12,223
Sales	2,320
Marketing	4,304
Total Salaries	**23,340**

Table 9. Department costs

Administration	(€)
Rent	684
Accounting	460
Utilities	37
Travel & Employee perk	728
Legal	293
Office Supplies & Equipment	460
Local Taxes	1,092
Cleaning Service	77
Compensations & Penalties	1,000
Other	81
Total Administration Costs	**4,912**

Table 12. Administration costs

R&D	(€)
Web (e-Commerce)	620
Software Licenses	544
Servers (ovh, siteground)	380
Total R&D Costs	**1,544**

Table 11. R&D costs

4.2.4 Financial Activities

In order to control the company cash flow requirements and its financial health. The finance team makes an estimation of the financial accounts (sales, revenues, costs) before the beginning of each financial term and inputs the real final value at the end of it. Estimations are based on the comparison between the expected and the real value and on the historical growth of main financial indicators and the company roadmap.

4.3 Organizational Structure As-Is

The company structure and the responsibilities of their employees have been analyzed in order to identify their weakness and decide on the necessity of a potential restructuring.

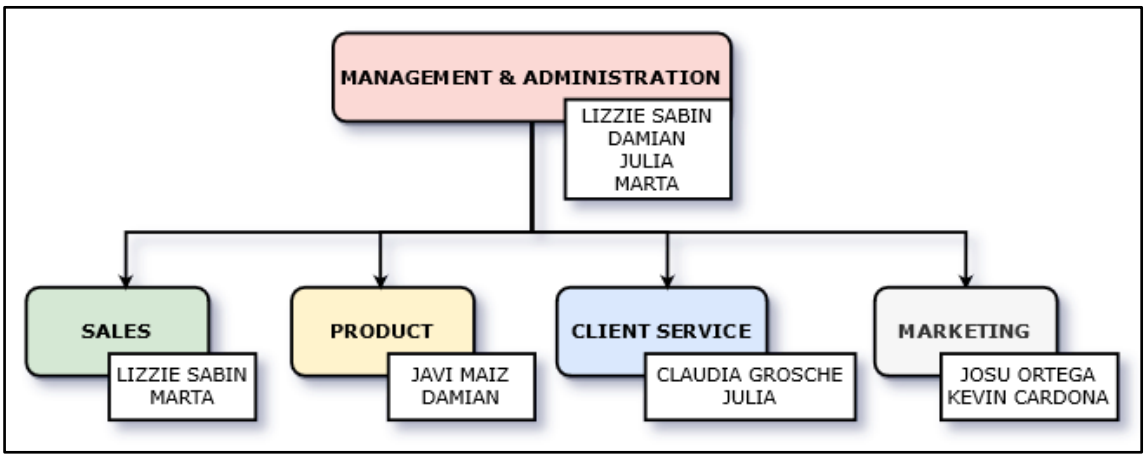

Figure 14. Organizational structure of SAYE

As it can be observed in the figure above, every business area works independently, and they are only linked by the board of managers. It also can be observed that some employees have responsibilities within different departments.

4.4 SAYE Business Plan and Barriers

Nowadays, SAYE has a good financial stability with a cash in hand up to € 248k. It makes possible to maintain the current infrastructure cost, estimated in about € 37k. So, the company has the required financial stability to invest on growing the business.

The aim is to expand the business through the retail market, not especially to increase sales and revenues, but to increase the brand visibility and scope. This way they would

get the loyalty of a wider target of customers, which would give the needed stability to expand their product portfolio.

One of the bigger issues that SAYE must face in order to achieve this goal is the logistics infrastructure, which is not ready to satisfy this demand requirements. More specifically, they often experiment stock outs as a result of an inefficient stock management system and an inaccurate demand forecasting. Therefore, they are often forced to satisfy retail orders with stock initially stored for ecommerce sales. To mitigate this risk, they end up making bigger orders, of about 6,000 units, equivalent to the sales of three months. This consequently causes a significant extra cost

In the graphs below, an overview of the current situation vs the future business plan can be observed.

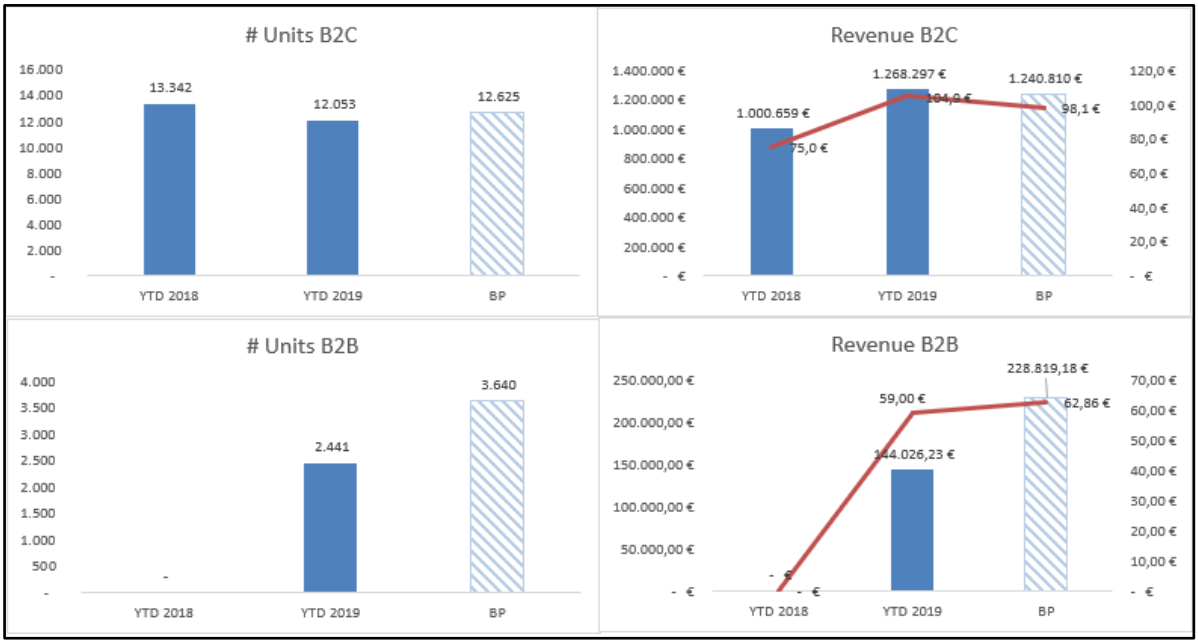

Figure 15. Overview of current situation vs the business plan

5 DEMAND FORECAST

A demand forecast process have been applied to our particular business case based on some of the takeaways obtained from the literature review (chapter 3.4.3). Furthermore, a new approach has been here developed and tailored to the particular business case. The techniques implemented in the case study are described next.

5.1 Quantitative Techniques Outcome

a) Average Time-Series Analysis**:** this is a simple method to estimate each month demand as the average demand of all previous months:

$$\text{Forecast}_{t+1} = Average\ Demand = \sum_{t=1}^{N} Dt / N \quad \textbf{(5-1)}$$

Variable	Definition
D	Demand
N	Number of periods with recorded demand

As it has been concluded from the literature analysis, a simple average is a suitable forecasting technique when there is a pattern of random data. However, it is not an efficient method to estimate demand when there is a detectable pattern of trend or seasonality. In addition, this technique works poorly with cases in which old data is irrelevant and not reliable. This deficiency in the average can be overcome by using a moving average.

b) Moving Average Time Series Analysis: this is a simple method to estimate each month demand as the average demand of a determinate number of previous months.

$$\text{Forecast}_{t+1} = Moving\ Average\ Demand = \sum_{t=1}^{N} Dt / N \quad \textbf{(5-2)}$$

Variable	Definition
D	Demand
N	Number of periods in the moving average

The figure below shows the behavior of the estimation curves for each selected number of periods vs the real demand curve.

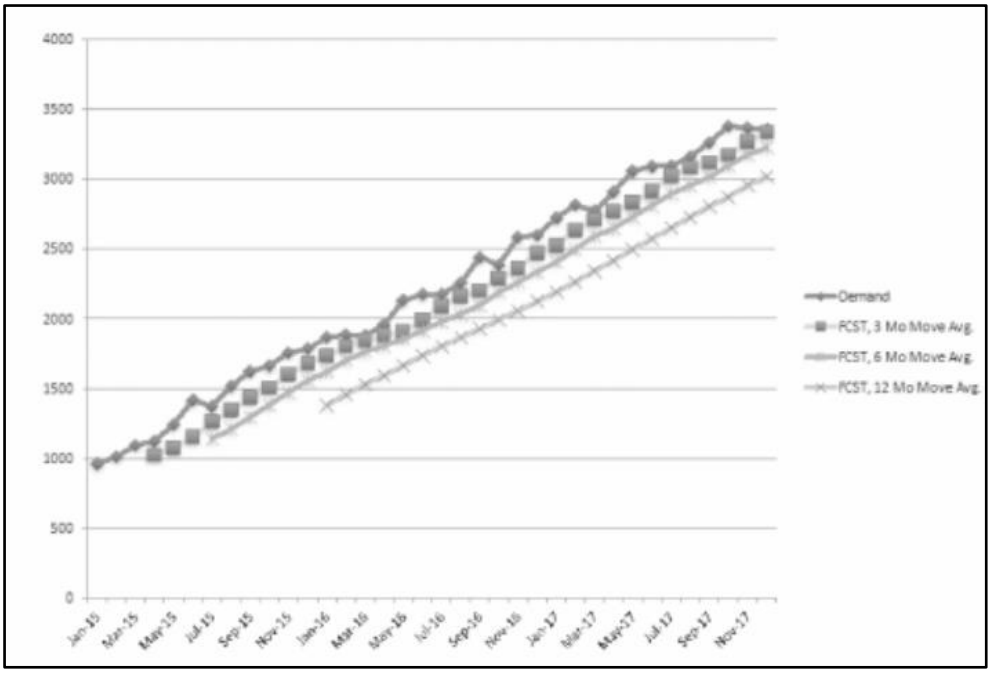

Figure 16. Moving average curve for different number of periods vs real demand.

In order to determine which moving average model would better approximate future demand, three trend lines have been built and benchmarked with SAYE historical demand data.

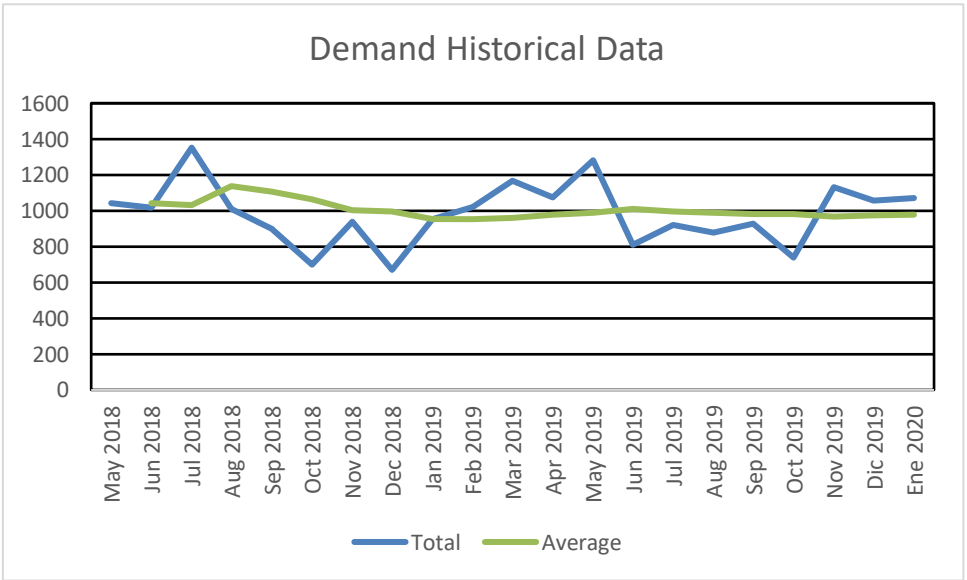

Figure 17. Average Time-Series Analysis vs SAYE historical demand

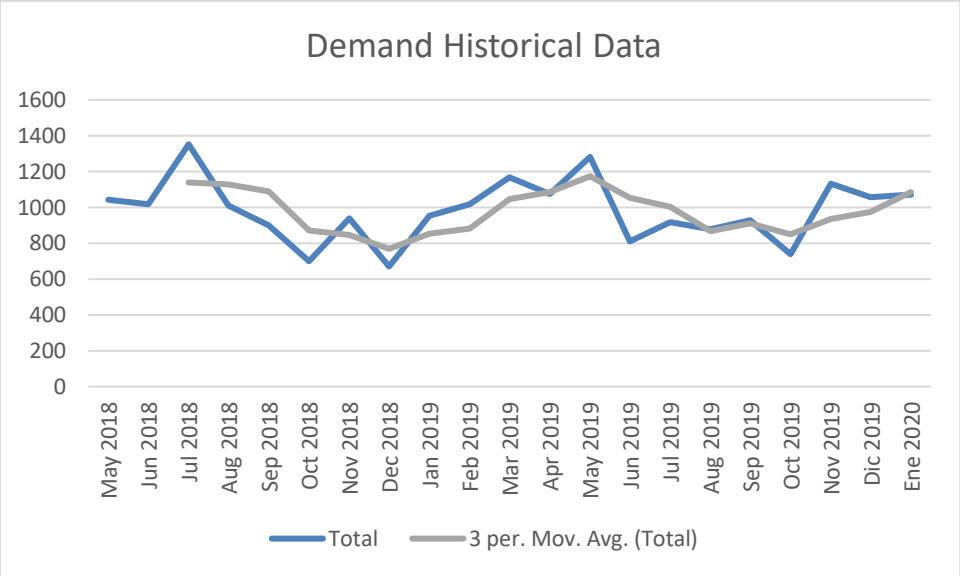

Figure 18. Moving Average Time-Series Analysis (3 months) SAYE historical demand

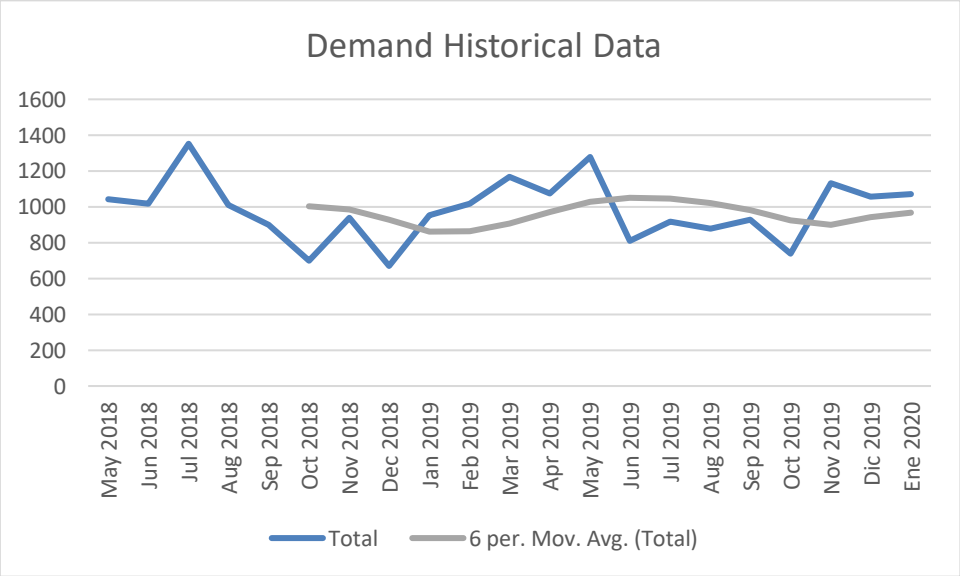

Figure 19. Moving Average Time-Series Analysis (6 months) SAYE historical demand

Judging by the results, it looks like the model that better imitates the historical demand is the moving average with 3 months per moving average. Besides, as SAYE total demand is following an upward trend, this technique is more suitable to estimate SAYE retail demand.

This technique has been applied to forecast the first month with no demand records (February 2020), resulting in 1,086 total sales. Since only the retail volume is relevant for this study, it has been obtained as the 25% of the total sales. This assumption is

based on the company expectations, stated in the business case analysis and results in 250 sales carried out through this stream every month.

Since this technique is based in historical demand data, it does not take into consideration the impact of new business strategies that aim to expand the company's visibility through retail commerce. In order to represent the expected demand increase, a growth rate of 133% have been assumed, based on the literature review (chapter 3.7) This would suppose 332 more sales per month and total retail sales would raise up to 582.

The graph below shows the final demand forecast outcome. It includes the historical demand during year 2019, the total expected demand during year 2020 and the split of this demand between retail and ecommerce channels.

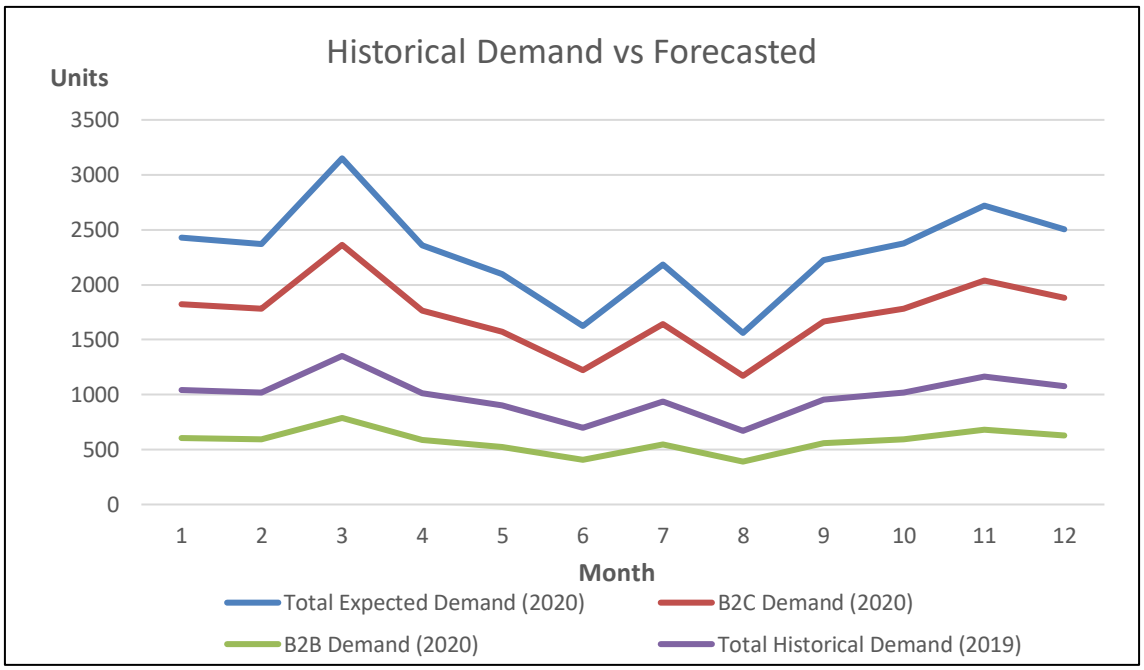

Figure 20. Total and B2B vs B2C demand forecast outcome.

5.2 Maximum Expected Demand

An alternative method has been used in order to calculate the maximum expected demand and to have an extra input against shortages. It consists of determining the average demand of the retailers currently partnered with SAYE and then extrapolate this number to the future number of retailers to which the company is willing to sell its product.

To do so, the average units monthly bought per retailer, have been recorded during the last 6 months of previous year, as it is shown in figure 21.

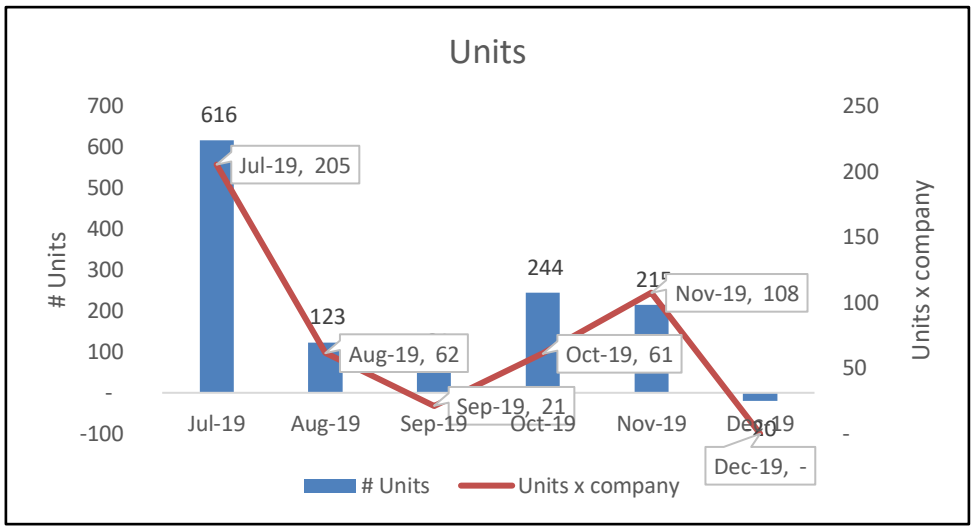

Figure 21. Average units monthly bought per retailer during last 6 months (2019)

The following information can be extracted from the graph above:

- SAYE sells to 6 fixed retailers and to an average of 5 additional sporadic retailers every month.
- Sales volume is 500 to 700 units every 3 months.
- The third month of each trimester they must deal with sale reversals, that is why December has negative values.
- The average sales per company is 76 units.

If a similar sales proportion is considered for each of the 15 retailers with which SAYE is aiming to establish a new commercial relationship, the extrapolation results in a total amount of 1,140 units per month (i.e. 76 units/retailer x 15 retailers)

In addition, a 10% reduction in total retail sales have been considered in order to represent the cannibalization effect. Therefore, the maximum expected sales volume is approximately 1000 units per month.

Considering all previous inputs leads us to forecast a demand interval, for the following year, between 600 and 1000 units sold per month and an average of 800 units.

5.3 Qualitative Techniques Outcome

In order to reinforce the previous numerical estimations, the following qualitative methods, described in chapter 3.4.3.3 have also been used.

- Jury of Executive Opinion
- Delphi Method
- Sales Force Composite

Once these methods have been applied with all company employees and external experts having participated, it has been concluded that a monthly sales volume of up to 76 per retailer is an oversized amount. This is not a reliable representation of real future demand because it is based in the data recorded during a short period of only 6 months. Furthermore, since a significant part of this sales volume is executed by sporadic retailers, it is not possible to know for sure that them will take place in a regular basis.

As a result, 40 sales per month and retailer has been established as a more adequate amount. This reduces the total sales to 600 units (i.e. 40 units/retailer x 15 retailers), which is much nearer to the amount previously estimated through mathematical methods (582).

To sum up, the business plan is to sell an average of 40 units per month and retailer to 15 different retail companies for a total of 600 units.

Nevertheless, it is important to take into consideration that there is a grade of uncertainty around any estimation and that the further into the future we are estimating, the more uncertainty will exist. Hence, this result will have to be periodically reviewed.

6 Proposed Strategies for Retail Activities

In this chapter, after carefully reviewing the literature and analysing the business situation, a set of strategies is presented based on the found materials and methods.

6.1 Business Integration

As it is widely exposed in chapter 0, business integration is a key factor that may interfere in achieving a seamless business process. Regarding SAYE business case, this solution is especially relevant to ensure integration between demand forecast and supply chain management. To that end, the following strategies have been carried out.

a) Organizational Structure Process

A new organization chart has been developed to strengthen the relations between the company departments. Future SAYE business activities and the relationships between them are shown in figure 22.

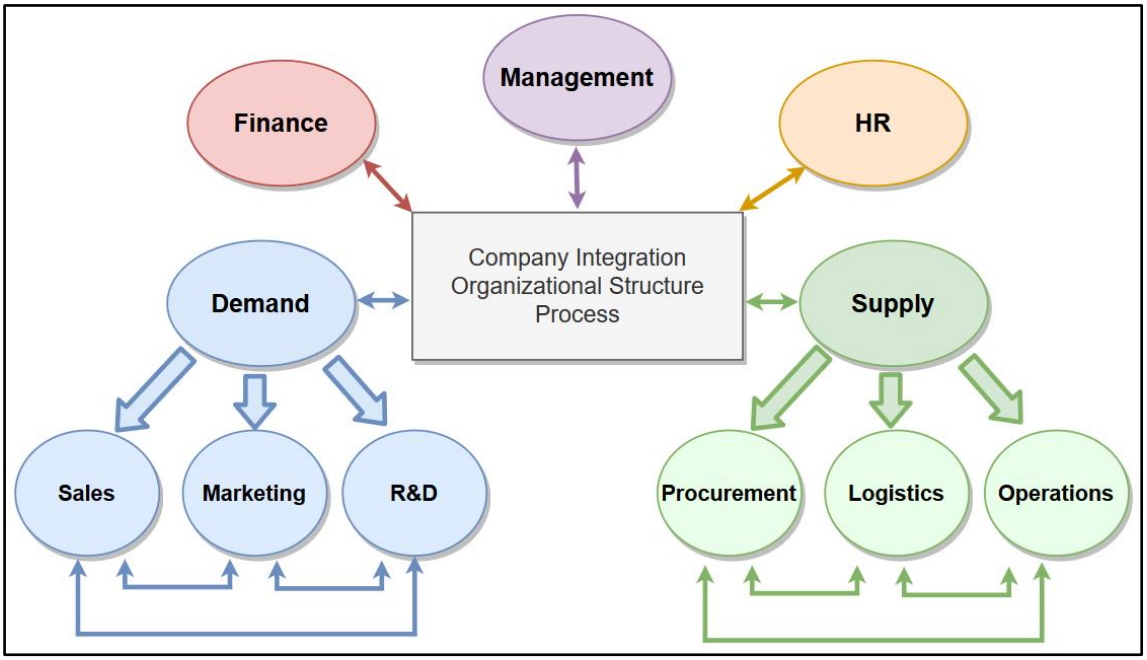

Figure 22. Organizational Structure Process for Business Integration

A workflow between the entities presented above has been designed in order to enhance demand-supply integration.

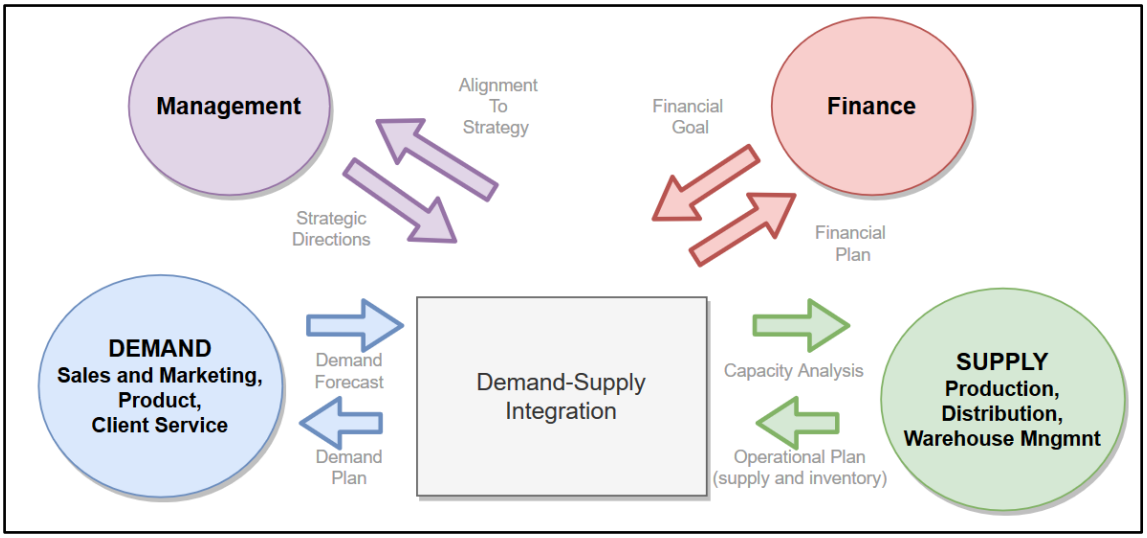

Figure 23. Demand vs Supply Workflow

Finally, other suggestions are made in order to carry out this restructuring efficiently.

- Hire a wholesale manager to work within the sales department, exclusively focused on B2B activities.
- Implement and ERP system to establish a common database among all business areas.

b) Identification of Integration Problems & Mitigation Strategies

In addition, the problems that may affect SAYE integration have been identified and a mitigation strategy has been proposed.

INTEGRATION PROBLEM	MITIGATION STRATEGY
Procurement department complain that sales overstates demand forecasts and does not sell the product, and so supply chain gets blamed for too much inventory	• Align production planning with the demand forecast results (chapter 5) • Apply distribution strategies (chapter 3.6.3) - Apply a selective approach - Use cloud-based systems - Implement CRM, sales order and logistics management systems • Apply inventory management methods (chapter 3.5.3) - Apply ABC classification - Use data analysis to identify stock issues - Adjust reorder point and EOQ
Sales team complain that manufacturing cannot deliver on production commitments and it is hurting sales	• Align production planning with the demand forecast results (chapter 5) • Define a clear organizational structure process (chapter 6.1)
Manufacturing partner complain that the sales team does not communicate when new product introductions should be scheduled	• Align production planning with the demand forecast results (chapter 5) • Define a clear organizational structure process (chapter 6.1)
Sales team initiate promotional events but fail to coordinate them with the supply chain	• Implement an ERP system to speed up intra-enterprise communications • Define a clear organizational structure process (chapter 6.1)
Raw material purchases out of alignment with either production needs or customer demand	• Apply purchase planning strategies (chapter 3.5.1) - Proactive approach - Adjust number of orders and batch size - Use purchasing software
The business management team do not identify potential risks and opportunities well ahead of time	• Establish weekly meetings with experts from all business areas to discuss new challenges and alternative procedures

Table 14. Identification of Integration Problems & Mitigation Strategies

6.2 Cost Reduction

The main business expenses have been identified based in the results presented in chapter 4.2.3. The tables and figures below show a ranking of these costs.

Operating Costs	(€)
Variable Costs	**63,345**
Sales & Marketing	24,424
Department Costs	23,340
R&D	1,544
Administration	4,912
Total Operating Costs	**117,566**

Table 15. Breakdown of Variable Costs

Variable Costs	(€)
COGS	38,881
Packaging	800
Marketing	885
Client Service (2)	4,732
Financial Comission (3)	3,816
Transport (1)	10,039
Warehouse (4)	2,668
Sustainable Donations	1,523
Total Variable Costs	**63,345**

Table 16. Breakdown of Operating Costs

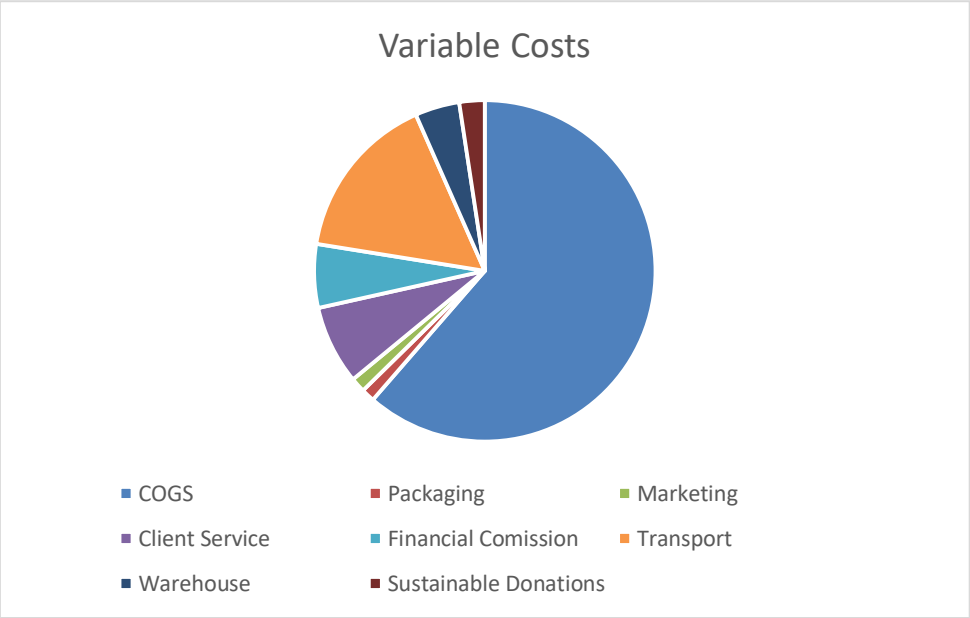

Figure 24. Breakdown of Variable Costs

Since SAYE does not participate in the manufacturing process, for the moment COGS expenses have very little opportunities to be reduced. A part of it, the main costs that need to be tackled are the ones under the categories of client service and transport. These issues and the strategies proposed to mitigate them are described next.

6.2.1 Implementation of Reverse Logistics Plan

The expenses caused by client service activities represent almost the 8% of the total company variable cost. Among the most common problems related to this issue, the one especially concerning SAYE activities is the large quantity of returned goods. As a result, goods cannot be well controlled and the rate of invalid deliveries increases.

The most common return causes that the company is facing are:

- Shortage of transportation.
- Repeated transportation.
- Product quality.

When the distribution center faces the goods returning from many stores, there is always a heavy commodity sorting work in order to distinguish the goods that can be sold back to the supplier from the ones that cannot. This activities cause an extra cost and time invested in addition of the lost sale opportunity.

In order to tackle this problem, returns will be managed based on a reverse logistic plan including the following measures:

- Minimum return amount: since the cost of returning every single issued item is higher than replacing them by new products shipped from the warehouse, the return will not be proceeded until a certain quantity to be returned is accumulated.

- Screening of returned goods: receive all the returned products from the retail stores in the system.

- Goods Categorization: goods returned to warehouse will be divided according to their condition refurbish to the sales price, wholesaler sales, return to the manufacturer, use for charitable donations, use for waste utilization and no use value.

- Make a comprehensive statistical analysis of the returned goods: identify the causes and the trend of the returns from every store and submit relevant reports.

This plan will reduce costs and enhance company reputation through customer satisfaction, while it will empower the commitment of the company with sustainability.

6.2.2 Reduction of Transport Cost

Among the best practices described regarding distribution activities, the selected strategies to streamline this business area are here described:

- Pay per pallet not per truck: since for the moment the volume of sales in the retail stream is not significant enough, the most of the times there is a truck capacity waste. An unnecessary cost is paid when shipping one unique pallet within a truck with capacity to up to 33 pallets. Therefore, it is necessary to redefine terms and conditions with current couriers and pay per pallet shipped, not per truck.

- Capacity maximization: it has been identified that the size of the shoes package is bigger than what is strictly necessary. By reducing the box size, it would be possible to place 3 more packages in each pallet. The new conditions are described in table 17.

Pallet volumen	1m x 1m x 1,2m = 1,2 m^3
Package volume	34cm x 23cm x 11cm = 8602cm^3
Number of shoes per pallet	139 units
Number of extra units per truck	3 x 33 = 99 units

Table 17. New conditions for capacity maximization

- Pay frights based on volume: after considering couriers service conditions and based on the calculations shown below, it has been determined that the shipping cost per pallet based on volume is cheaper than the one based on weight.

Pallet volume	1.2 m^3
Pallet weight	666 kg
Ground freight (volume vs weight rate)	1m^3 = 333 kg
Cost per freight	50 (€ / m^3)
Shipment cost based on weight (per pallet)	$\frac{666\ kg}{333\ kg}\ x\ 1m^3 = 2m^3\ x\ 50\frac{€}{m^3} =$ **€ 100**
Shipment cost based on volume (per pallet)	1.2 m^3 x 50 € / m^3 = **€ 60**

Table 18. Shipping cost per pallet

6.3 Reduce Stock Inconsistencies

As it has been described in the business case the current strategy for purchase orders is based in a reactive approach. During last year, an order equivalent to approximately 5 times the monthly sale, was placed every two months in average. So, although they experimented punctual shortages, most of the time they had excessive stock levels.

Here, some inventory management strategies are proposed to improve customer service and reduce extra costs.

- Determination of optimal batch size:

$$\mathrm{Q} = EOQ = \sqrt{\frac{2\ x\ D\ x\ Cf}{P\ x\ h}} \qquad \textbf{(6-1)}$$

Variable	Definition	Value
EOQ	Economic Ordered Quantity	
Cf	The incremental cost to process an order. This cost is variable and precisely depends on the batch size.	$\frac{60\ (\frac{€}{pallet})}{139\ (\frac{units}{pallet})}\ x\ Q = 0.43Q$
D	Annual demand	600 units per month x 12 = 7,200 units
P x H	The incremental annual cost to carry one unit in inventory	365 x 0.01 (€/unit*day) = € 3.65

$$\mathrm{Q} = \mathrm{EOQ} = \sqrt[2]{\frac{2*7{,}200*0{,}43*Q}{3{,}65}} = \mathbf{1{,}420.27\ units} \qquad \textbf{(6-2)}$$

The most economic order quantity would be to order batches of 1,420 units.

- Assemble-to-order: since the demand forecast outcome reduces uncertainty regarding the expected production needed, it is now possible to change the orders strategy from make-to-order environment to assemble-to-order. This allows the manufacturing process to start even before receiving the customer orders and thus the lead time between the batch order and the batch receipt is reduced. More specifically the lead time will be reduced in 6 weeks, which is the time it takes for pre-assembling process. As a result, instead of 2.5 months, YouShoes will only need 1 month to fulfil the purchase order. This way a quicker response capacity is acquired to deal with unexpected demand requirements.

- Order frequency: it has been calculated to reduce variability in placing orders and avoid stock inconsistencies. The order frequency has been obtained based on the annual demand and the economic ordered quantity.

$$\frac{1420\ units * 12}{7200\ units} = 2.4\ months \quad \textbf{(6-2)}$$

- Determination of Reorder Point Time (r): it is the minimum stock level (safety stock) at which a new order needs to be placed in order to avoid shortages. It has been calculated based on the result of the forecasted demand (600 units per month), the security rate (1.25) and the new lead time (1 month).

$$600\ \frac{units}{month}\ x\ 1\ month\ x\ 1.25 = 750\ units \quad \textbf{(6-3)}$$

$$\frac{1420\ units * 12}{7200\ units} = 2.4\ months \quad \textbf{(6-4)}$$

Figure 25 shows the inventory management planning based in the parameters calculated above.

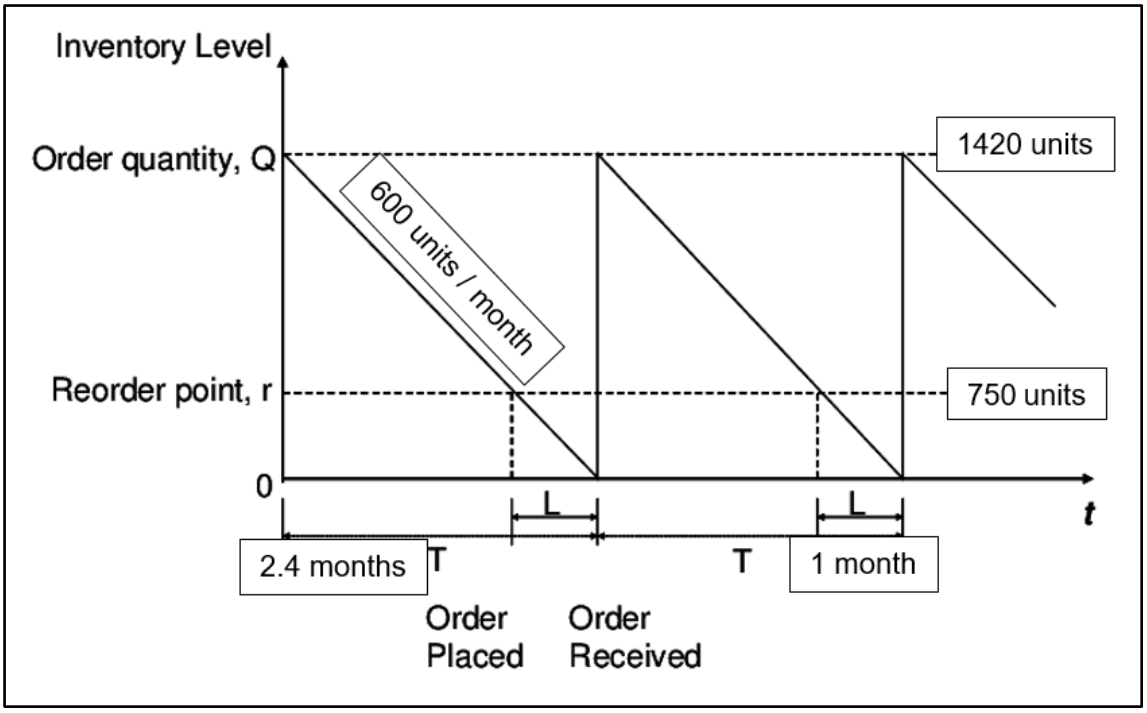

Figure 25. Inventory management planning

6.4 Information Systems Implementation

Based on SAYE operational requirements, it has been determined that the Implementation and Integration of an ERP system would be highly beneficial. An initial benchmarking of possible ERP systems has been carried out in order to identify which one better suit SAYE requirements according to its capabilities and accessibility.

The modules that are aimed to be acquired through the implementation of this system are:

- Sales Orders Management
- Integration of available stock with website sales platform
- Purchase Orders Management
- Website platform & stock availability integration

7 DISCUSSION & CONCLUSION

This section evaluates the outcomes of the thesis, analyses in which grade the initial goals have been achieved, discusses the project limitations and states the further work needed.

7.1 Research Overview and Outcomes

This thesis had looked to answer the research question:

> "How to realign the business model of a footwear manufacturing SME to enable transition toward traditional retailing with physical stores."

The outcomes of this research can be divided between outcomes form which any business within the retail or consumer goods industry could take advantage, and outcomes which are specifically useful for SAYE business case.

On one hand, the literature review has allowed to identify most common challenges that can been encountered in similar scenarios and it provides an overview of all relevant areas for any company with supply chain activities.

Whether the aim is to enter a new market or to improve the supply chain performance of a company within consumer goods industry, these methods and materials, can be used as an efficient methodology to ensure every relevant activity is reviewed. This research places in one unique report the most relevant findings of the work of others. Therefore, it works as a guideline of interest to any business aiming to:

- Analyse the trends and state of the art of an industry.
- Identify wholesaler best practices.
- Select or know more about demand forecast quantitative or qualitative methods.
- Use warehouse management to avoid shortages and optimize costs.
- Design an appropriate distribution plan.
- Track the financial health of the business.

On the other hand, through the business case study and discussions with company experts, this paper provides an example of how to audit the AS-IS situation of a business in order to have an overview of its financial situation and business activities.

Finally, it validates the efficiency of the research findings by tailoring them to the specific SAYE case, a start up within footwear industry. The following solutions have been proposed to help the company meet their growth goals through retail market expansion.

- Application of a quantitative and qualitative approach to estimate sales volume growth. The expected monthly sales have been established in 600 units and the demand distribution forecasted can be observed in figure 20.
- Restructuring of the company business areas and determination of relationships between them to ensure business integration. The result is shown in figure 22 and 23.
- Implementation of reverse logistic and distribution strategies to reduce the main costs previously identified in customer service and transport areas.
- Definition of an inventory management plan including an EOQ model and new replenishment policies. Shown in figure 25.
- Specification of the ERP system capabilities that should be implemented.

7.2 Objectives Met and Research Implications

Based on the conducted study the objective of identifying methods and best practices around retail and supply chain industry have been totally achieved. Furthermore, an overview of every step within the supply chain have been here highlighted, from procurement to product distribution and warehouse management.

Regarding the investigation of the business case the initial goals have been fully achieved through the analysis of business historical data recorded and the outcomes of interviews to company CEOs. Every business activity have been detailed, together with the company organizational structure and its financial situation. This have made possible to identify transport, client service and warehouse management as the main business weaknesses.

The aim of realigning SAYE model to facilitate its business growth have been achieved through a list of proposals (chapter 6) supported by the findings of the previous study.

Overall, the study has been successful in:

- Providing a methodology to evaluate business AS-IS and enhance its supply chain activities.
- Providing an overview of a specific business case.
- Obtaining a demand forecast result which to reduce uncertainty.

- Suggesting purchasing, warehouse and distribution management realignments to meet demand requirements, reduce costs and adapt to new business scenario.

The findings of the current study have implications on any business looking to enhance its supply chain activities. Specifically, it can have an impact on company owners by providing an exhaustive research on supply chain industry, that can empower their decision-making towards the business expansion through retail. Besides, the results of the current study can also help retailers that are looking to increase their sales while optimizing resources allocation.

7.3 Research Limitations and Future Research

Some challenges and limitations have been faced along the development of this thesis.

- Time: the initial project scope was defined according to a time availability that has been reduced at some point along the project, due to a change in my professional working conditions.
- Communication: communication with thesis supervisors and SAYE employees has also been affected by the unprecedented situation caused by Covid19 pandemic.
- Word count limitation: the maximum word length (8,000 words).
- Restricted knowledge: the poor knowledge about the researched topics, together with the narrow trajectory of SAYE and their employees.

As a result, the cost benefit analysis section, initially included in the project goals, has not finally been included.

Finally, the following actions are recommended to be considered in future research.

It is recommended that studies in the future ensure the validation of the results obtained in this report. Practical assessment is the best way to prove their feasibility. For instance, in the future months the demand forecast result needs to be validated with actual demand values. In addition, future studies should use more than one method to estimate demand and compare their performance with the one developed in the demand forecast chapter.

Finally, it is recommended that further studies indulge in further analysis of ERP systems. Benchmark the systems listed and evaluate the key capabilities identified in the thesis findings in order to select the most appropriate system for SAYE.

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APPENDICES

Appendix A Interview Transcript

All the collected information in the Interview to Co-founders Lizzie Sabin, Pablo Marín and Damian is here presented. The main information obtained is highlighted in bold.

About SAYE Finance

How do you control the company financial activities?

We make an **estimation of the financial accounts** (sales, revenues, costs) before the beginning of each financial term and input the real final value at the end of each terms. New estimations are made **based on the comparison between the expected and the real value**, every time a new value is input the estimations are updated. The estimations are also calculated based on the **historical growth of main financial indicators and the company roadmap.**

Despite the methodologies used, this is an environment with a big grade of uncertainty, therefore sometimes it is complex to accurately estimate the cashflow requirements or to identify when is it possible to approach the company break-even point, etc.

Which are the monthly costs of the company?

The basic monthly costs of the company can be observed in the tables below. They are divided in **Variable Costs (which depend on the number of commercialized units),** R&D, Sales & Marketing activities, Administration (which represents costs linked to the company human resources)

About Sales Channels

Which are the current SAYE Sales Channels?

We currently sell shoes through two different channels:

B2C (Business to Consumer) which includes all sales where customers are directly reached with no intermediate agents. It means units sold through ecommerce. Although **the startup was initially built up with the income obtained from sales through Crowdfunding platforms** such as Indiegogo and Kikstarter, from November 2019 SAYE has its own ecommerce platform.

B2B (Business to Business) which includes all sales to retailers. Nowadays SAYE has only 11 retail partners, but many others have shown real interest to commercialize our products. The aim is to create a reliable structure to meet this new upcoming demand.

Which are the differences between the profitability of these two sales channels?

The cost drivers and its value used to calculate profitability vary depending on each one of these channels.

Although all products have common costs regarding the manufacturing and logistics, products sold through B2C have additional costs related with sales campaigns, marketing and financial commissions. The reason why these costs are not included in B2B is that the amount of sales made through retail market is still not significant in comparison with ecommerce. Therefore, **all investment in marketing and the services outsourced for financial support are only focused in B2C.**

The **revenue** x unit sold through each channel is **also quite different**. The price per unit is about **105€ in B2C while in B2B sales it is less than 60€.**

The mentioned revenue as well as a detailed breakdown of cost drivers together with its average value used to calculate the profitability per unit in each one of this sales channels, **can be observed in chapter 3.2.**

About the Manufacturing Process

How is the manufacturing process managed?

Since SAYE is for the moment a small startup with no capacity to own the manufacturing activity, this **service is outsourced to a Portuguese company** named “YouShoes” that manufactures SAYE shoes in its factory in Portugal.

The **price per unit is about los 29€ in average**, which does not include the transport cost.

How do you manage the Purchase Orders?

Every day we review and **update in an excel sheet the number of sales orders received through the e-commerce platform, the present stock, the expected in-bound units and the estimated sales per month for each product type**. **Based on this data and with the aim to avoid stockouts, we decide when and how many units should be ordered.**

The strategy is to make **orders every two months with the aim to maintain a security stock level equivalent to 2.5 times the monthly sales**. As a result, we are currently ordering **about 2000-2500 Uds,** which is what the company historically sells every two months. The problem is that this demand is continuously growing so we are increasing the size of the ordered batches again and again.

The lead time since the purchase order is released until the batch is receipt takes from 2 to 3 months.

About Warehouse Management

How many warehouses do you have? Where? With which capacity? Is the warehouse management an outsourced activity?

We **outsource this service to a company named NAEKO** who manages a warehouse in Sant Boi de Llobregat less than half an hour away from Barcelona city center.

There we maintain a **stock level of about 2000 units**, although **they have capacity** to maintain much more since it is a large warehouse equipped with the latest technology.

How do you manage the shipping activities? How many units do you approximately distribute per day?

All products manufactured in Portugal are transported to NAEKO, where all orders from final customers or retailers are received and satisfied.

We are currently working with one unique Courier, UPS. **Every day** around 4:00pm, regardless the number of orders received, an **UPS truck picks up all due deliveries**.

We sent **about 40 to 60 units per day to final customers**, while the number of orders received for shops has a great variation, **some months we can send up to 700 units through B2B only.**

Which are the costs linked to warehouse management? Is it a fix or variable cost?

The cost for warehouse management depend on many parameters. NAEKO charges a different price each month based on number of stock in/out-bound, stock maintained, labelling…

About Distribution Channels

Who are your distribution partners? Which services do they offer and with which frequency? Which are the cost drivers?

On one hand we have partnered with "**CS transitorios**" **for all product transport from the factory in Portugal to the Warehouse in Barcelona**. We use their service occasionally, **once every two months approximately**.

On the other hand, we have hired the services of **"UPS" for all distributions from NAEKO warehouse to final customers and retailers.** As it has been explained before, UPS makes one pick up per day.

The cost charged by both partners varies **according to the number of deliveries**.

The transport cost is included in the final price to final customers, while for retail sales this cost is charged separately, unless they manage the procurement themselves through their own distribution services, but this is an exceptional situation.

Who are your packaging partners? Which services do they offer? Which are the cost drivers?

We have two partners in charge of packaging activities:

"Enveseur": they **manufacture three types of packages** for 1, 2 or 4 pairs of shoes and send them to NAEKO warehouse for the packaging process.

"Sheedo": they provide us with **tomato seeds** that we include in the box of each pair of shoes. **The costs vary according to the quantity ordered which is normally of 5.000 units.**

About SAYE Business Strategy

Which is the growth strategy of the company in the short and long term and why?

Nowadays SAYE has reached a good financial stability with a **cash in hand up to 248k €** which makes it possible **to maintain the current infrastructure** with an **estimated average cost of about 37k €. So there is no urgent need to increase revenues and we have the required financial stability to invest on growing the business.**

The problem is that a significant part of the total company revenues depends on sales to final customers made through ecommerce. **Although the margin profit in online sales**

is higher than retail sales, the aim is to expand the business through the retail market not to increase sales and revenues in this channel but to increase the brand visibility and scope. This would result in reaching a higher number of customers worldwide and in an increase of benefits ultimately.

One of the bigger issues that we must face in order to achieve this goal is our logistics infrastructure, which is not ready to satisfy this demand requirements. More specifically, **we have an inefficient stock management**. As a result of the **inaccuracy in demand and stock estimations**, we are often **forced to satisfy retail orders with stock initially stored for ecommerce sales, which results in stockouts. To mitigate this risk, we end up making bigger orders**, with badges of about 6.000 units that represents the sales of three months, but it **consequently causes a significant extra cost.**

Many shops have shown interest on acquiring our products, last month we sold up to 1.300 units in B2B. However, **until we get an efficient logistic strategy, we have to reject many requests** and therefore nowadays **SAYE only sells shoes to 11 shops.**

The business plan for next two years is to increase a 50% the number of units sold in the retail market which means roughly 1,200 more than last year up to a total of about 3,640 units sold per year through this channel. **It would represent an increase of almost a 60% in the revenues currently obtained from this source**. Nevertheless, as it can be observed in the graphs above, **B2C market will still suppose about the 84% of the total revenues in the short term.**

Which are the most significant parameters for the validation of new strategies?

Based on what has been explained before, the main goal is to enter the retail market with the best strategy to **produce the greater possible impact in the total annual demand.** We expect to obtain a **growth in the total number of sales** (not necessarily in revenues) **both online and shop sales,** by **empowering the visibility and the strength of the brand trough the retail market**. This way we would get the loyalty of a wider target of customers, which **would give us the needed stability to expand our product portfolio.**

Appendix B Further Definitions

SCAN*PRO: [XXV], decomposes the sales of a brand in for a brand into own- and cross-brand effects of prices, feature advertising, aisle displays, week effects and store effects.

PromoCast**:** [XXVI], Promotion-event forecasting model. It uses a static cross-sectional regression analysis of SKU per store sales under a variety of promotion conditions, with store- and chain specific historical performance information.

Dynamic regression model**:** [XXVII], It captures the effects of variables such as past sales, trend, own and competitor prices and promotional variables, as well as seasonality.

Jury of Executive Opinion: [XXIX], The general practice is to bring together top executives from different business areas who provide background information, experiences, and opinions to the board of directors.

This exercise usually leads to a quicker and more reliable result without the use of elaborate data manipulation and statistical techniques.

Delphi Method: [XXX], it that helps a group of experts, as a whole, to deal with a complex problem. and obtain the most reliable consensus.

It is typically based on a series of questionnaires, feedback of individual contributions, assessment of the group judgment and a degree of anonymity for the individual responses.

Some applications of the Delphi method in a particular forecast demand issue could be:

- Identification of research topic: demand forecast specifications such as period sales channel, product type.
- Specification of research question(s): to determine variables of interest to determine forecasted demand and generation of propositions.
- Preliminary identification of causal relationships: for instance, direct correlation between business actions such as marketing campaigns or promotions and demand increase.

Sales Force Composite: [XXXI], This method is especially useful for companies with a broad market presence wherein the sales agents forecast the sales in their respective territories, which is then consolidated to develop an overall company sales forecast. The sales force gives their opinion on sales trend to the top management. Since the salesmen

are very close to the market, can give a more accurate sales prediction on the basis of their experience with the direct customers.

This method is again based on the judgments but is different from the jury and survey of expert's opinions method. The difference is while both the methods depend on the judgments made by a few top executives, the sales force composite methods encompasses the aggregate judgments of the entire sales force. Furthermore, this method is more reliable because of a large population sample and moreover, it can be readily broken down into product-wise, month-wise, area-wise forecast.

Distributors: A distributor is a wholesaler who, in addition to fulfilling retailer orders, they actively sell products on behalf of the producers. Their responsibilities include from managing orders and returns to acting as a sales representative. They perform market analysis and search for new opportunities to achieve peak sales performance. A distributor focuses on a particular market in order to cultivate strong relationships with manufacturers.

They have the option to sell to retailers and other sellers, or directly to consumers and businesses.

Wholesalers: A wholesaler fulfills orders of retailers, by reselling goods, often in large quantities for manufacturers. Wholesalers purchase in bulk, typically, which lowers the price, from either distributors or manufacturers. This allows wholesalers to make a profit because they are able to sell to retailers in smaller packages obtaining a profit margin. Unlike distributors, wholesalers only deal with the storage and delivery of goods.

Retailers: Retailers are the outlets where consumers can purchase products. This is local grocery store or walmart down the street. They can sell through storefront locations or through online channels. Retailers purchase products from distributors or wholesalers.

Brokers and Agents: Make way for agents. They handle the logistics of the sales. Agents handle contracts, marketing, and pulling together specialized shipments. A part of their job is customer relationship management. On behalf of manufacturers, they take ownership of products through the distribution process. They represent the producer in the sales process.

Intensive: this type of distribution aims to provide saturation coverage of the market by using all available outlets. For many products, total sales are directly linked to the number

of outlets used (e.g., cigarettes, beer). Intensive distribution is usually required where customers have a range of acceptable brands to choose from.

Selective: selective distribution involves a producer using a limited number of outlets in a geographical area to sell products. An advantage of this approach is that the producer can choose the best-performing outlets and focus effort on them. Selective distribution is appropriate when consumers have a preference for a particular brand or price and will search out the outlets that supply. It also enables the firm to establish a good working relationship with channel members.

Exclusive: The firm distributes its brand through just one or two major outlets in the market, who exclusively deal in it and not all competing brands. This form of distribution obtains a high prestigious image. Through this strategy, the manufacturer hopes to have control over the intermediaries price, promotion, credit inventory and service policies.

Appendix C Project Gantt Chart

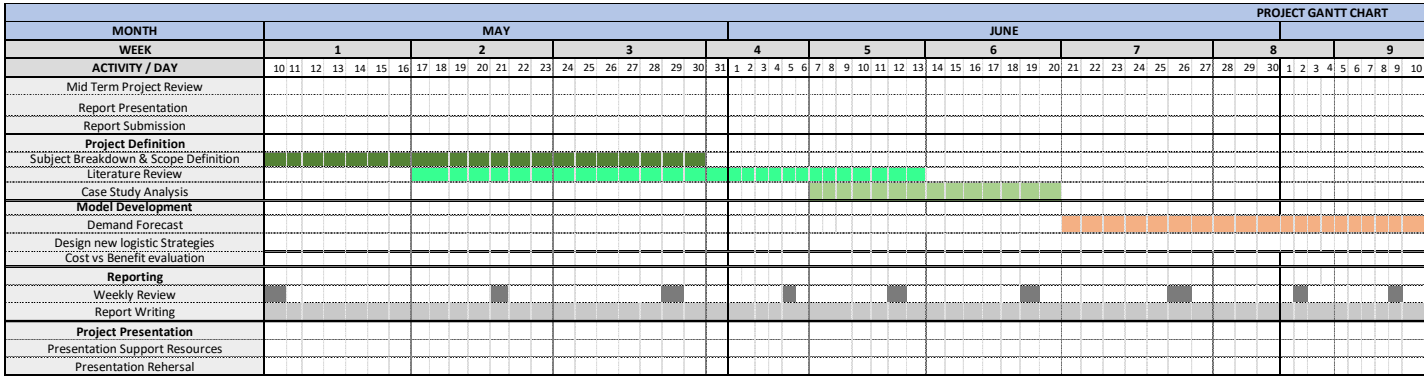

Figure 26_Apx. Project Gantt Chart (May to June)

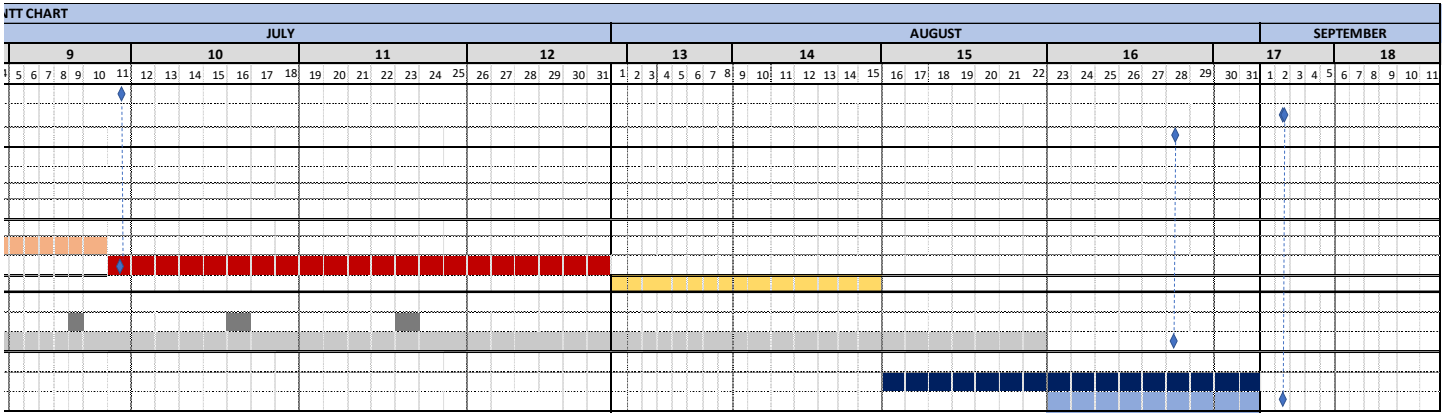

Figure 27_ Apx. Project Gantt Chart (June to July)